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VOCATIONAL TRAINING OF ADULTS IN THE UNITED STATES

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INTERNATIONAL LABOUR OFFICE

GENEVA

1948

The I.L.O.

The International Labour Organisation is an association of nations, financed by Governments and democratically controlled by representatives of Governments, of management and of labour organisations.

Its purpose is to promote social justice in all the countries of the world. To this end it collects facts about labour and social conditions, formulates minimum international standards, and supervises their national application.

The machinery of the Organisation consists of :

The International Labour Office, which acts as a secretariat, a world information centre, and a publishing house. It is staffed by experts drawn from many different countries, whose knowledge, experience and advice are available to all the nations which are Members of the Organisation. It has branch offices and correspondents in many countries.

The Governing Body, composed of 16 Government representatives, 8 representatives of management and 8 representatives of labour, which is the executive council of the Organisation and exercises general supervision over the work of the Office and frames its budget.

The International Labour Conference, which is a world parliament for labour and social questions. Each national delegation to the annual meetings comprises four delegates, two representing the Government, one representing management, and one representing labour ; each of these three sections speaks and votes independently, so that all points of view find full expression.

The Conference adopts minimum international standards which are formulated in special international treaties called *Conventions*, and in *Recommendations*. These are based on careful fact-finding and discussion. As a two-thirds majority of the Conference is required for their adoption, they represent the general agreement of informed world opinion. Since the first Conference in 1919 the Conference has adopted 90 Conventions and 83 Recommendations. These deal with hours of work, paid vacations, women's work, the protection of children, prevention and compensation of industrial accidents, insurance against unemployment, sickness, old age and death, colonial labour problems, conditions of seamen, etc. The substantive provisions of the Conventions and Recommendations, together with other documents and information relating to international labour standards, have been brought together in a volume entitled *The International Labour Code*, published by the Office in 1941.

The decisions of the Conference are not automatically binding. Governments must submit the Conference standards to their national legislatures. If a legislature accepts a Convention, the Government is bound to apply the Convention and to submit an annual report showing how it is applying it, which is scrutinised by special I.L.O. committees.

The Philadelphia Conference in 1944 adopted a Declaration, affirming the primacy of the social objective in national and international policy. Instruments for the amendment of the Constitution of the Organisation were adopted by the Paris Conference in 1945 and by the Montreal Conference in 1946 ; these instruments, having obtained the necessary number of ratifications, have come into force.

By an agreement which was ratified by the Montreal Conference and subsequently by the General Assembly of the United Nations the International Labour Organisation has entered into relationship with the United Nations as a specialised agency.

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PREFACE

The preparation of a series of monographs on vocational training and retraining in different countries forms part of a special programme of work on manpower problems which the Governing Body of the International Labour Office authorised in March 1948 for the purpose of assisting Governments, employers and trade unions on problems of vocational guidance, training and retraining, collecting information on manpower surpluses and deficits in relation to international migration, and establishing an international nomenclature of occupations most frequently concerned in such migration. In pursuance of the Governing Body's decision, the Office is also organising a special library and documentation service on vocational guidance, training and retraining, which is available for consultation by all who have a serious interest in these problems, and it is prepared to give Governments technical advice on these problems if invited to do so.

The monograph on the training of adult workers in the United States of America is divided into seven chapters. The first sketches the development of training programmes for adults up to the present, with special emphasis on war experience of the training of adults, and concludes with a brief over-all picture of existing training activities. Chapter II describes training for adults under the Federal-State vocational education programme. Apprentice training is dealt with in Chapter III. The fourth chapter covers in-plant training conducted by private undertakings, and the fifth describes briefly the training within industry programmes for supervisory workers. In Chapter VI, attention is called to the training activities of the trade unions. The last chapter notes the special provision made for or questions arising in the training of veterans, women and disabled persons. A select bibliography is appended. The monograph does not cover the subject of training for professional and technical work or for agricultural employments.

The Office wishes to acknowledge the generous help in the preparation of this monograph given by agencies of the United States Government — in particular, the U.S. Office of Education (Vocational Division) and Office of Vocational Rehabilitation of

the Federal Security Agency, the Bureau of Apprentice Training and the Women's Bureau of the U.S. Department of Labor, and the Veterans Administration — by several State departments responsible for vocational education, by various industrial establishments, including those whose training schemes are used as examples in Chapter IV, and by the Training Within Industry Foundation, the American Management Association and the National Industrial Conference Board. Acknowledgement is also due to the U.S. Office of Education, the Office of Vocational Rehabilitation, the U.S. Department of Labor, the U.S. Veterans Administration and the industrial establishments concerned for permission to use the photographs which are reproduced in the monograph.

ED93

CONTENTS

	Page
PREFACE	III
CHAPTER I. *General Introduction*	1
Experience of Adult Training up to 1939	2
Experience during the Second World War	9
The Present Situation	21
CHAPTER II. *The Federal-State Vocational Education Programme*	26
Legislative Basis	27
Objectives of Training	29
Estimation of Training Requirements	30
Categories of Trainees and Types of Training	31
Public Supervision or Control	33
General Administrative Organisation	33
Advisory Committees	36
Relations with Employers' and Workers' Organisations	38
General Organisation and Methods of Training	39
Training of Vocational Instructors	56
Research	61
Conclusions	62
CHAPTER III. *Apprentice Training*	66
Legislative Basis	67
Federal Financial Aid	67
Federal Apprenticeship Standards	68
Administrative Organisation of the Apprenticeship Programme	70
General Procedure and Conditions of Apprenticeship	79
Conclusions	95
Annex : Apprenticeable Occupations	97
CHAPTER IV. *In-Plant Training Conducted by Private Undertakings*	105
A. Brief General Survey	105
Objectives of Plant Training Programmes	106
Types of Training and Categories of Trainees	107
General Organisation : Summary	118
B. Examples of Plant Training Schemes	123
Caterpillar Tractor Co.	123
Allis-Chalmers Manufacturing Company	128
Johnson and Johnson Company	131
Curtiss-Wright Corporation	139
Scovill Manufacturing Company	146
Champion Paper and Fibre Company	154
A Southern Textile Mill	156
Annex : Training Methods and Materials	161

Page

CHAPTER V. *Training Within Industry for Supervisors (T.W.I.)* . 164

Types of Training 166
T.W.I. Trainers 174
Administrative Organisation 176
Research 177
Results of T.W.I. 178

CHAPTER VI. *Training Conducted by Trade Unions* 179

Technical Trade Training of the International Printing Pressmen and Assistants' Union of North America 180

CHAPTER VII. *Provision for Special Training Needs* 185

A. Vocational Training for Ex-Service Personnel 185
Objective 186
Types of Training 186
B. Training of Women for Production Work 192
C. Special Provision for the Retraining of Disabled Adult Workers 197
General Policy and Organisation 198
Home Training for the Seriously Disabled 206

Select Bibliography 207

CHAPTER I

GENERAL INTRODUCTION

Primarily because of the character of its industrial development, the training of adults for industry in the United States has been traditionally a responsibility of industry itself. The extremely varied demands of industrial establishments for the training of their labour force made it impracticable to attempt to meet training requirements in vocational or technical schools or centres. Managements and trade unions, individually and through their trade organisations, have promoted and developed many industrial training programmes which are specifically designed to meet the needs of their particular trades and industries. All these programmes provide for training on the job, which is supplemented in most cases by related technical instruction, and in some instances for vocational training, which is usually given in the vocational schools. Some industries prefer to organise and operate their own training without any outside assistance, others have their own training and merely make what use they wish of the advice of Government training agencies, and still others find it more effective to use the facilities of local vocational and technical schools and institutions for all forms of training conducted away from the job.

In practice, therefore, industry's responsibility for training is shared with vocational and technical schools and other formal institutions for the training of workers. The system is based on a recognised distinction between the acquisition of technical knowledge and the application of technical skill. The former — the acquisition of knowledge — is more the domain of Government training agencies, while the latter — the application of skill — is more the domain of in-plant training conducted by industry. In the public training institutions, the point of view is necessarily that of acquiring, for the most part, technical knowledge, whereas in industrial establishments the emphasis is primarily on applying knowledge and acquiring practical skill. Thus the training of

adults provided by the Government through formal schools or other institutions necessarily differs from the training given by many industrial enterprises within their various plants and offices. Both types of training are necessary; they tend to supplement each other in practice, because neither alone could do the whole job successfully.[1]

Experience of Adult Training up to 1939

Public initiative in the training of adult workers for industry really stems from the first World War, during which an extended programme of intensive training was set in motion. At about the same time, the interest of many private undertakings in the preparatory training and upgrading of their workers began to crystallise and to take shape in more systematic programmes of in-plant training.

After the war, however, these activities diminished. Government initiative remained on a small scale so far as the training of adults was concerned, though a few trade organisations were interested in the training of apprentices, and a number of the larger industrial undertakings continued to provide training because their experience had shown that the training of adult workers was an important function of progressive management. From the end of the first World War up to the depression, there was a relatively small amount of unemployment in the United States, and this probably helped to limit any extension of public or private activities in the field of industrial training for adults. However, the depression and mass unemployment that settled over the country after 1929 gradually emphasised the importance of the question of vocational training for unemployed adults. In 1930, for example, the question was raised openly by the Federal Board for Vocational Education[2], and in 1931 the Board stated its urgent concern with the assistance that public vocational

[1] Cf. *Petroleum Industry Training*, by C. R. Dooley, Director of the Training Within Industry Foundation, a paper prepared for the second session of the I.L.O. Petroleum Industry Committee (Geneva, November 1948).

[2] Federal Board for Vocational Education: *Annual Report*, 1930, p. 15: "Large numbers of employees are continuously being thrown out of employment by the introduction of labour-saving machines and the specialisation of jobs, all tending to produce a certain amount of labour turnover, and it may fairly be proposed as a part of the job of the vocational programme to provide opportunities for the retraining of these displaced workers for such jobs as they can secure under the new conditions."

education could render in the unemployment crisis.[1] Several of the States began to give their attention to ways and means of opening the regular vocational education facilities, maintained under the co-operative Federal-State programme, to unemployed adult workers and of co-ordinating such retraining with placement and guidance services. No effective national and few State systems of public employment offices or unemployment insurance, and no integrated system of unemployment relief, were operating in the country at that time. It was therefore left to the vocational education authorities to take the initiative in dealing with the occupational adjustment problems of unemployed workers. Private in-plant training facilities contracted rapidly as a result of the depression, thus closing for all practical purposes that avenue of training for adults.

Adult Training under the Federal-State Programme of Vocational Education

At the end of 1931, the Federal Board for Vocational Education suggested : *(a)* that existing trade preparatory schools or courses should admit unemployed workers for thorough training in some specialised unit, to the extent to which their facilities permitted and when the need for the training had been endorsed by a local representative advisory committee ; *(b)* that existing part-time schools or courses should also admit unemployed adults for training in some specialised unit under the same conditions ; and *(c)* that, in adapting their programmes to the needs of the unemployed group, each community should secure the advice and technical assistance of the State and Federal Boards for Vocational Education. In other words, the Federal authorities suggested the use of existing vocational education facilities for the training of the unemployed, adapting them as necessary to meet the special requirements of this group. This principle was accepted by the States ; and as a result, the measures taken to train adult workers for employment were kept within the general framework of existing vocational education institutions. However, though some States set in motion training schemes for adults, in most States the general situation remained unsatisfactory : while the system of vocational education for young people was good, these facilities were not available for adults in proportion to their needs, whether to meet mass unemployment or displacement of workers due to techno-

[1] IDEM : *Annual Report*, 1931, p. 9.

logical change, or the migration of industry or other factors.[1]

Efforts continued to be made by vocational education authorities, however, to develop training services for the unemployed. The staff of the Federal Board for Vocational Education gave technical assistance to the States on the adaptation of their programmes to the emergency unemployment situation. Within the States, most localities, in turn, opened more of their vocational classes to unemployed workers or organised special instructional units for them. Many thousands of adults received vocational class instruction.[2] Steps were also taken to work out more co-operative relations with industrialists and trade unions, *e.g.*, through the establisment of representative State and local advisory committees.

In June 1934, a special conference of State educational authorities worked out modified standards of eligibility for training and of vocational courses for adults, in an effort to adapt vocational education to the needs of the unemployed. These standards were adopted and apparently achieved their purpose of making it easier for more States to maintain special classes for unemployed persons needing "refresher" training (for refreshing and modernising their skills in their own or related trades), and to provide short training courses to meet the particular needs of unemployed persons generally. Adult retraining schemes were reported to have been "conspicuously successful".[3] The vocational education programmes organised within the public school system included special courses for training unemployed workers back into employment, pre-apprentice training for younger unemployed workers, the opening of regular vocational courses for the enrolment of unemployed adult workers, and the training of unemployed workers as teachers of vocational courses for adult workers.

[1] See, for example, FEDERAL BOARD FOR VOCATIONAL EDUCATION, Bulletin No. 159, General Series, No. 4: *Vocational Training and Unemployment* (1931); COMMONWEALTH OF MASSACHUSETTS: *Final Report of the Special Commission on the Stabilisation of Employment, 1932*; and *American Federationist*, July 1936.

[2] Cf. SECRETARY OF THE INTERIOR: *Annual Report for the year ended 30 June 1934*, p. 293. (In 1933 the Federal Board for Vocational Education was transferred to the Department of the Interior and made an Advisory Board, and a Vocational Division was established within the Department.)

[3] *Idem, Annual Report for the fiscal year ended 30 June 1935*, pp. 282-283. The Committee on Economic Security, in its *Report to the President of the United States* (Washington, January 1935), declared emphatically that "the educational and vocational equipment of individuals is a major factor in their economic security", and added: "In a day and age of rapidly changing techniques and market demands, many people will find it necessary to make adjustments long after they have first entered industry. Adjustment of our educational content and techniques to this situation is a vital need in a long-range program for economic security."

In accordance with the growing recognition of the importance of adequate vocational facilities, the Federal Government increased its subsidies to the States for this purpose. The President, in signing one such Act, explicitly stated that he hoped that the funds so made available to the States would be used for the benefit of the unemployed. Moreover, much Federal technical assistance was given to State supervisors of vocational education, school officials and relief authorities in planning their programmes to deal with emergency needs. In many places special conferences were held to work out the methods of adapting regular day-school classes and part-time schools to the needs of adult workers.

The continuation of mass unemployment in both urban and rural areas suggested the need of further expansion of vocational training in all fields. Thus, in 1936, additional funds for vocational education were made available to the States by the Federal Government under the George-Deen Act of that year. The States, which were required, as a condition of receiving grants, to report on the proposed use of the funds, specified that they would expend them, among other things : (1) for special classes for unemployed youth who had had no special training ; and (2) for retraining classes for unemployed adult workers who had either lost their jobs because of technological changes within their trades and had become difficult to place in employment owing to long disuse of their special skills and abilities, or who needed training for newly developing types of employment. Up to the outbreak of war, vocational education programmes continued to include vocational training for unemployed workers, both through evening or part-time classes in shop work and related instruction and through short intensive courses designed for adults and directed towards definite occupational goals.

Additional steps were taken to encourage the training of apprentices. A Federal Committee on Apprentice Training was established, operating at this time as an interdepartmental committee, composed of Federal Government respresentatives together with representatives of management and labour. This Committee drew up standards and procedures for apprenticeship which it recommended to industry. It also urged the States to establish State apprenticeship councils representative of employers and workers within the State who were concerned with the training of apprentices, for the purpose of promoting the development of State systems of industrial apprenticeship. The Federal Committee also recommended that a technical staff should

be provided by the Federal Government to work with the States and the national trade organisations in developing programmes for the training of apprentices.

Despite the progress made in adapting the nation's existing vocational education facilities to meet the needs of adult workers, these steps were not on a large enough scale to represent an effective move to meet the training needs of adults. In 1938, the Advisory Committee on Education, in a report to the President, declared that relief rolls and unemployment registers bore evidence of a heavy social burden resulting in part from the inadequacy of present measures for retraining unemployed workers. "In general", it added, "the public school authorities have not been particularly alert to serve the needs of this part of the population, despite the fact that service to this group is one of the major objectives of the present Federal programme of vocational education."[1]

Vocational Training for Adults in connection with Unemployment Assistance

In addition to using the vocational school facilities for retraining unemployed persons, a certain amount of adult training was carried on in connection with unemployment relief projects. Co-operation between the Federal, State and local vocational education authorities and the emergency relief agencies began to be organised systematically after the Federal Government entered the relief field in 1934. Funds were made available for emergency relief vocational education and training programmes, most of which were worked out by the relief authorities in co-operation with the Federal and State Boards for Vocational Education.

The special training projects were organised first under the Federal Emergency Relief Administration and subsequently under the Works Progress Administration. Such projects included vocational classes for unemployed adults who needed training to make them employable and vocational rehabilitation for physically disabled unemployed adults. The Vocational Division of the Federal Office of Education co-operated, in an advisory capacity and by lending members of the staff, in organising these

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[1] ADVISORY COMMITTEE ON EDUCATION : *Report of the Committee* (Washington, 1938), p. 133 ; Staff Study No. 8 : *Vocational Education* (Washington, 1938), pp. 197-198.

emergency education programmes. The experience of the vocational and trade schools — and frequently their facilities and equipment as well — was placed at the disposal of the emergency relief agencies.

A further programme of vocational training for unemployed workers developed with the Federal Works Programme. Under the work relief programme of the Works Progress Administration [1] (W.P.A. — the major agency of the Works Programme) a census of the skills of the unemployed workers of a locality who were eligible for W.P.A. employment, and of the employment and public works needs of the locality, would be prepared and the works projects for the locality determined on that basis. If the skills of the available unemployed persons and the needs of the locality did not coincide, some sort of retraining was provided to fit the unemployed workers to meet the employment demands of the region. However, there were serious practical limitations on the training and retraining aspects of the works programme, though an effort was made to centre the programme around the skills and abilities of the unemployed, to diversify it to meet the training needs of various groups within the unemployed population, and to provide useful training and work experience for particular groups of people in their particular skills or in suitable occupational categories. The work experience on the great bulk of W.P.A. projects did not, in most cases, provide any useful vocational training for unemployed adults, the principal difficulties being the lack of existing employment opportunities and of any effective means of determining what the future employment plans would be, and also the practical need of having to set up work projects which could not always provide much variety in training opportunities.[2]

The two Federal agencies for assisting unemployed young workers, the Civilian Conservation Corps (C.C.C.) and the National Youth Administration (N.Y.A.), dealt largely with untrained, out-of-school young workers. One of the major objectives of both these agencies was to provide useful vocational training for youthful unemployed citizens of the United States who were in need of relief.

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[1] Later called the Works Projects Administration.

[2] The best examples of the training aspects of the W.P.A. programme were the sewing projects and the domestic service programmes for unemployed women workers, both of which included a considerable amount of training on the job. The construction programmes for men included some, but not much, training.

Nearly 50 per cent. of all the educational activities in the C.C.C. camps were vocational in nature. Organised training on the job was carried on in connection with the work projects themselves (largely forestry work, park development, soil conservation, etc.). In addition, class instruction was offered in such occupational fields as commercial pursuits, the building trades, electrical work, mechanical work and agriculture. Each man might receive at least 10 hours a week of general educational and vocational training. The C.C.C. training was soundly organised and generally successful. The camps were sometimes criticised for not offering more specialised training; for example, a W.P.A. official stated that the C.C.C. enrollees learned about work but too few of them learned skills that had labour market value.[1]

The N.Y.A. work projects provided employment mainly on clerical work, construction and improvement of public buildings and sewing and workshop projects, and, to a less extent, on educational projects, professional and technical work, etc. There was little question that the N.Y.A. work programme helped to compensate for lack of any work experience and to a certain extent served to develop skill and improve general employability among the project workers.[2]

Situation at the Outbreak of the Second World War

Whatever training was provided for adults through the works programme (including the youth programmes), however, it was not intensive specialised training. The programme provided, rather, a pre-training service. The only opportunities for adults to learn any elements of a skilled trade or to get training in most semi-skilled occupations were in the country's regular vocational education institutions or within industry itself. However, their opportunities for receiving any systematic training in industry were severely limited by depression conditions; and the vocational schools had not been able to go very far in adapting their facilities to the training needs of adults.

Nevertheless, certain developments of the years before the second World War made the initiation of a broader training programme for adults easier. In the first place, the employment service had been expanded to the point where it could provide

[1] Nels Anderson: *The Right to Work* (New York, 1938), p. 60.
[2] Cf. Advisory Committee on Education, Staff Study No. 13: *The National Youth Administration* (Washington, 1938).

more specific information on employment demands in any local community and act more adequately as a co-ordinating agency in any training programme. Secondly, an unemployment insurance system had come into operation and steps had been taken to integrate it with the employment service. Thirdly, measures had been taken to co-ordinate the relief system with placement and insurance operations. Finally, increasing research had been undertaken into unemployment and re-employment opportunities, into changes in industrial techniques and their effect on employment and into other aspects of the labour market. Thus the structure for dealing more adequately with the training needs of adults was being developed.

The next problem was to make effective use of this framework. The impetus came to hand in the industrial demands of war conditions. Cries of a shortage of skilled labour were raised in 1938 and 1939. It began to be suggested that steps should be taken to train some of the millions of unemployed who had never had a chance to acquire skill. The 1939 National Conference on Labour Legislation urged the appointment of a representative national committee to promote the retraining of adults. It struck an important note, stating that the training of adults was fundamentally an industrial problem and that the solution must be found by industry itself, in collaboration with Government agencies. With the shortage of skill, many of the larger industrial establishments began to take a fresh interest in plant training schemes.

This pre-war experience provides an excellent illustration of the fact that training and retraining facilities for adults are of relatively little use when there are no jobs. This was emphasised by the Assistant Work Projects Commissioner in 1939: "Since training workers for jobs which are not available is pointless and wasteful, this work can be most advantageously carried out in conjunction with comprehensive policies leading to full employment." [1]

Experience during the Second World War

During the war adults were trained for industry on a vast scale. The training was carried out through the co-operative effort of governmental training services and private industry.

[1] Corrington Gill: *Wasted Manpower* (New York, Norton & Company, 1939), p. 263.

During this emergency period, the services of Government training agencies were greatly expanded. Large numbers of workers had to be trained in a short time, and industry could not reasonably be expected to bear the added costs of training. The situation was complicated by the fact that the training conducted during the years preceding the war had not been extensive and effective enough to provide a reasonable number of skilled workers who could assist in the process of absorbing and training a large number of unskilled (or unskilled in the industry) workers.

Experience of the vast training programme during the war indicated that there was a great demand for governmental assistance in the preparatory training of workers during the period when a plant was being built or before it was actually in production. After the plant was in production or had expanded, as the case might be, and when there had been sufficient time to establish efficient operating procedures, it was usually found more effective to allow industry to assume the responsibility for training on the job, and to supplement this by other forms of training, provided by Government training agencies and specifically determined for each occupation or job classification.

The approach to the wartime training may be summarised as follows :

(1) to plan the training to meet the requirements of the production plan ;

(2) to provide pre-employment training for specific jobs in preparation for a predetermined need ;

(3) to provide pre-employment training for those types of jobs (job classifications) where the training for initial or starting skill could be more effectively conducted away from the job ;

(4) to provide a co-ordinated plan for on-the-job training that would become effective when a plant was ready to start production ;

(5) to provide adequate supervisory training ;

(6) to provide for progressive training (job progression training) to ensure the flexibility in skills required to meet possible changes in production or in personnel (quits or absences) ;

(7) to provide competent training personnel to assist the supervisors in developing a training procedure to meet their needs ;

(8) to provide for the training of apprentices to meet the future demand for skilled craftsmen ;

(9) to provide such specialised training as might be required to support the productive activity, *e.g.*, for inspectors of the product, planners, schedulers, supply personnel, guards, etc.

The Defence Training Programme

The defence training programme was initiated in 1940 to train and retrain workers for industries essential in the conduct of the

ED93

war. The new programme was based on a complete training service to industry offered by Government training agencies which were equipped to assist in the establishment of all forms of industrial training. This encompassed the country's network of vocational schools, organised in co-operation with industry and operated within the administrative structure of the regular Federal-State vocational education scheme. The defence training programme therefore had access to personnel, equipment, facilities and experience which otherwise would have been impossible to obtain.

The first step was to make an inventory of the equipment and training capacity of the vocational schools and to estimate the need for trained workers in defence industries. The survey of vocational facilities indicated that there were over 1,000 public vocational schools, representing an investment of at least $1,000 million (half of it in machinery), and 22,000 vocational instructors in trades and industries related to defence. Training capacity in vocational shops equipped to provide defence courses was estimated at about 50,000. Training needs were for at least a million trained workers every year, and especially for hundreds of thousands of workers in shipbuilding and aircraft manufacturing. On the other side of the picture, there were 10 million unemployed persons potentially available for training.

In June 1940, Congress passed a law [1] appropriating funds for preparing unemployed persons for defence employment and for upgrading the skills of workers already employed in industries related to defence. This Act laid a foundation for the wartime training programme which remained unchanged, for the most part, throughout the war. The major differences between the wartime training programme and the regular programme of vocational education may be summarised as follows :

(1) Short " unit " trade courses were worked out to train production workers, in the least possible time, to perform single-skill operations in mass production ; these took the place, for adult workers preparing for defence jobs, of the longer peacetime courses designed to teach a number of skills and the related trade knowledge.

(2) The defence programme was financed entirely by the Federal Government, whereas under the regular programme State

[1] Public No. 668, 76th Congress.

funds were required to match Federal funds. Moreover, under the emergency programme the funds were supplied, regardless of population, according to the training needs of war industries, and they could be used for more purposes, such as equipment and premises.

(3) Certain classes of trainees had to be recruited through the employment service under the defence programme, whereas under the regular programme the schools were entirely responsible for the selection of trainees.

From 1940 to 1945, no major changes were made in the operation of defence training. Minor changes included provisions to enable the States to make use of private training facilities and to co-ordinate training more closely with manpower supply and needs.

The training given under the programme varied with the industrial needs and employment situation of the war. With a huge reserve of unemployment, the first stage naturally emphasised pre-employment and refresher training courses. At the next stage, these courses ceded place little by little to supplementary training courses for employed workers ; this change corresponded to the growing industrial practice of hiring workers and training them for particular jobs in the undertaking, usually through the so-called plant vestibule schools (training given in a special room or part of the plant in conditions approximating to ordinary working conditions). By the third stage, pre-employment training had almost ceased and training on the job supported by supplementary training, whether for inexperienced or for experienced workers, was the core of the defence training programme.

Most of the defence training was provided through the regular vocational school facilities. In addition, in many cases local vocational schools set up special training facilities at or near the plant entrance and sometimes inside the plant. These facilities were used, in co-operation with the plant management, for the initial training of new workers employed in the plant and also for the upgrading of the plant's labour force.

Pre-employment courses provided intensive training for particular jobs in war industries, usually training the workers in a single-skill operation of a mechanical character in mass production and omitting related instruction. In general, these courses were given for at least 30 hours a week and wherever possible for 40 hours or more a week. Trainees were placed on the job in defence

industries as soon as they mastered the essentials of the job for which they were training ; in many cases, they were encouraged to leave before the completion of the course so that their training would be directly related to the job itself. Training periods were shortened by more effective production methods that required less versatility in the application of skills. Sometimes the courses were as brief as two to three weeks. More often they averaged six to twelve weeks in length, comprising 200-500 hours of instruction and shop work. Refresher courses, designed to refresh and modernise the skills of unemployed industrial workers, were organised along the same lines.

As workers became scarce, supplementary preparatory training was given to new and inexperienced workers, who were hired and paid by industry and who worked on production assignments while receiving their initial training. What was called production line training developed out of this practice. Vocational instructors and supervisors selected articles from the regular production lines whose manufacture involved useful operations from a training standpoint. New workers were trained to production line standards, slower in tempo at first but always working to standard quality specifications. The instructors were employed by and responsible to the local vocational schools and not the management of the industrial plant. The plant foreman was responsible for the production ; the job instructor for the knowledge and skill needed for the production work; the inspection of products was on the same basis as that for all others in the plant. This type of training worked out successfully and is a good example of wartime co-operation between industry and Government training agencies. The trainees were able to "earn, learn and produce" at one and the same time.

Training for foremen and other supervisory personnel was also carried on under the defence training programme. This type of training reached nearly a million persons between 1940 and 1945. Supervisory courses were conducted inside and outside industrial establishments for persons employed as foremen, leadmen, supervisors or in any supervisory capacity. The nature, content and extent of the course varied with the particular needs of the industry or plant concerned. These needs were often analysed carefully, either by special plant or industry committees, or by discussion conferences or by the local vocational education authorities. The training for supervisory personnel was rooted in the conference method (groups of experienced supervisors working with a qualified leader) ; in some cases, especially where persons with less ex-

perience were brought together, the conference method was combined with regular classroom instruction. Foreman training conferences were conducted on a 30-hour basis, while job instructor training courses (to teach foremen to teach production workers) were organised, as a rule, on a 10-hour basis. Follow-up training was usually given as an integral part of the supervisory training within six to twelve weeks of the initial training period ; the follow-up consisted of inspection and further discussion of problems and methods.

Moreover, to meet the unprecedented demand for supervisory personnel, a Training Within Industry (T.W.I.) Service was set up. This Service concentrated on the training of wholly inexperienced supervisory personnel, while the supervisory training under the Office of Education, noted above, worked largely with experienced persons. The T.W.I. provided three basic and standardised units of training, each one comprising ten hours. "Job instructor training", given in five two-hour group meetings (or two two-hour and two three-hour meetings), was aimed at training new supervisors in how to train new workers to do a particular job in the least possible time. "Job methods training" (offered in five two-hour meetings) was designed to improve the production methods of foremen and their subordinates. "Job relations training" (also in five two-hour sessions) was provided in order to help supervisors to improve the handling of human relations problems encountered in their work. A fourth unit of training, "programme development", was set in motion towards the end of the war.

Apprentice training was also brought within the framework of the defence programme, offering a well-rounded course for the skilled trades. To some extent, apprenticeship standards were modified to meet war requirements, but on the whole few substantial changes of principle were made. Apprentice training was carried out in close co-operation with the supervisory training schemes and the vocational school defence courses. It remained on a relatively small scale during the war.

The Apprentice-Training Service also took the responsibility for upgrading within industry. It developed, in co-operation with industry and the T.W.I., an "advancing workers" programme, for which the following standard content was worked out :

(1) a description of each job for which a training programme has been designed, covering the work processes to be taught and including an accurate statement of working conditions on each such job ;

(2) a statement indicating what types of persons shall be considered eligible for training, and the procedures and devices to be employed in selecting them ;

(3) provision for the establishment of a record system covering the progress and advancement of the individual " advancing worker " ;

(4) provision for adequate supervision and instruction in shop work ;

(5) provision for related technical instruction where this facilitates performance of the job ;

(6) provision for payment, throughout the training period, of wage rates equal to at least the minimum rates for every job classification in which the worker is successively employed ;

(7) a statement to the effect that, in the interest of national defence, the prescribed training period for " advancing workers " on each process shall be the minimum required for competence in that process ;

(8) provision for the development of " advancing worker " programmes by co-operative arrangement between the employer and his employees (where a joint apprenticeship committee exists, this committee's participation in the formulation of the programme is essential).

The objective was to meet production needs in a particular plant, and thus, from the practical viewpoint, there was little purpose in attempting to define short-term training too rigidly.

The training of vocational instructors became an all-important part of the wartime training programme. In general, the vocational instructors for industrial training were selected from among outstanding journeymen or leadmen in the trades and industries concerned. Such persons knew their trades but often lacked skill in imparting their knowledge to others. Short courses were organised to teach them how to teach others, which included job analysis and teaching methods, followed by visits made to the instructors' classrooms or workshops to observe them in action and help them in their day-to-day work.

The Government's war training programme was on a huge scale. During the period 1940–1945, more than 7,500,000 persons were trained for defence or war employments. Through the intensive, streamlined courses offered for adults, millions of untrained workers were prepared quickly and adequately for particular jobs, enabling vacancies in essential industries to be filled. The co-ordinated efforts of industry and the vocational schools made the training realistic. Industry learned more about its particular training needs and job requirements ; and the vocational schools and other training agencies (such as the Apprentice-Training Service and the T.W.I.) learned more about the jobs for which training was needed, and designed practical courses to meet the specific industrial needs.

The experience gained by the public training agencies in many fields has been useful in meeting the problems of training and retraining encountered during the transition to peace.

Company Training Programmes

The defence training programme was only one side of the wartime training. The basic work of training adults for industrial employments was done on the job by private industry. This was true throughout the war[1] but especially in its later stages. For the purpose of training, industry worked more closely than ever before with the Government training agencies, relying on them for many kinds of assistance, including help in setting up plant training programmes or adapting them to emergency requirements and in training supervisors to train new production workers.

Plant training was centred on meeting specific needs. In most cases, particular attention was given to *(a)* initial training to break in new workers ; *(b)* upgrading training of experienced but unskilled production workers to specialist jobs requiring specific skills and of semi-skilled workers to jobs requiring higher skills ; and *(c)* training of new supervisory workers and supplementary training of experienced supervisors. Many plants inaugurated formal training plans for the first time and allocated training responsibilities to a particular company official or department. There is no way of estimating the extent to which plant training moved for-

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[1] In September 1939, the National Industrial Conference Board called attention to the need to train quickly large numbers of specialised workers to meet the requirements of defence industries. It suggested a series of principles to help industrialists work out intensive training plans. These principles were drawn from the methods of the War Department's Committee on Education and Special Training, established near the end of the last war, and were set out under the following substantive headings :

(a) define and keep up to date the specific requirements of all jobs to be filled ;
(b) give training in a centralised vestibule school, with trainees, equipment and instructors in one place ;
(c) provide instructors with uniform written descriptions of procedure and manuals for every type of work ;
(d) reduce classroom work to a minimum, train on the job so that the worker learns by doing ;
(e) train the man well in part of a trade, do not train him a little in too many parts of a trade ;
(f) base the individual's training directly on his experience ;
(g) start from this point, and break the skill still to be learned into a series of jobs of increasing difficulty ;
(h) give the trainee a clear, concise description of each job and check his understanding of the work by questions.

All these principles were applied in some form in the course of the 1939-1945 war training programme.

ward in United States industry under the impetus of war conditions, but it seems to be agreed by all who have knowledge of what happened that interest in training was intensified and broadened ; that in-plant training became far more extensive, reaching into smaller as well as larger companies and into all kinds of industries and activities ; that what training was given was better organised and more realistic in relation to plant production requirements ; and that a good deal of what was done during the war has a bearing on the longer-term post-war requirements of industry.

Training Aids

Various means to assist in organising or providing training were used during the war on a wider scale than ever before. In this connection, particular reference should be made to the visual aids units of the Office of Education and the training films made by private industry. The work of job analysis was pushed ahead and training timetables were more widely used. Under the stimulus of the manpower shortage, manning tables (analyses of manpower requirements) were prepared in plants seeking additional workers, and "groups of training periods" were worked out to classify the approximate standard times in which it should be possible to train men and women for particular types of jobs.[1] Other aids to training included technical selection tests, used in selecting trainees for admission to training and for distinguishing any particular aptitude or capacity.

[1] A large number of standard jobs were studied and each job was listed by the War Manpower Commission under one of the training time groups shown below :

Group	W.M.C. training period	
	Length	Equivalent in hours
E	1 hour — 2 months	1 — 416
D	2 — 6 months	416 — 1,248
C	6 months — 1 year	1,248 — 2,500
B	1 — 2 years	2,500 — 5,000
A	2 years and over	5,000 and over

It should be noted that most of these estimates are substantially lower than prevailing normal peacetime estimates.

Summary of Wartime Training Services

The training services available during the war are summarised below in tabular form.

Trainees and type of training	Scope of training	Purpose of training	Agency providing training[1]
Plant training directors or co-ordinators.	4-day (32 hours) work session.	To assist those responsible for training to identify needs, organise programmes and increase effectiveness.	T.W.I.
Employed supervisors in job instruction, job methods, and job relations.	10 hours' intensive practice.	To assist first-line supervisors in acquiring these skills in their everyday on-the-job work.	T.W.I. in co-operation with State Boards for Vocational Education.
Employed workers in planning for pre-production or production training to be provided by the employer.	Training for specific operations.	To provide for instruction of workers by employer during hours of employment.	A.T.S.
Employed workers in advancing worker and upgrading programmes.	Organised and formalised plans for training machine operators and process workers (flexible number of hours).	To develop specific skills in individual workers through : (*a*) organised work experience ; (*b*) supplementary training.	(*a*) A.T.S. (*b*) Vocational schools.
Employed workers in trades and craft apprenticeships.	Comprehensive programme of 4,000 or more hours' shop experience with supplementary instruction.	To develop all-round skilled mechanics through : (*a*) organised work experience ; (*b*) supplementary instruction.	(*a*) A.T.S. (*b*) Vocational schools.
Pre-employment training (leads to employment).	Specific and intensive training for definite payroll jobs in war industries.	To prepare individuals for entrance into war industry employment as production operators and process workers.	V.T.W.P.W. through public vocational schools.
Pre-production training and training on production (for employed workers).	Training in the performance of specific operations.	To provide instruction for beginning or potential workers during hours of employment.	V.T.W.P.W. through public vocational schools.
Supplementary training.	Instruction in skills, techniques, and/or special knowledge.	To increase the effectiveness of employed workers.	V.T.W.P.W. through public vocational schools.
Conversion training.	Training in specific operations and related knowledge.	To train workers in operations requiring new skills.	V.T.W.P.W. through public vocational schools.
Refresher training.	Training in manipulation skills and related knowledge.	To refresh dormant skills and knowledge of craftsmen.	V.T.W.P.W. through public vocational schools.

[1] A.T.S. = Apprentice-Training Service ; E.S.M.W.T. = Engineering, Science and Management War Training ; F.W.P.T. = Farm Workers' Production Training ; T.W.I. = Training Within Industry Service ; V.T.W.P.W. = Vocational Training for War Production Workers.

Trainees and type of training	Scope of training	Purpose of training	Agency providing training [1]
Training for industrial supervisors.	Short unit courses in supervision.	Training of supervisory personnel as instructors and conference leaders to assist them in carrying out their responsibilities as managers, supervisors and instructors within their respective departments.	V.T.W.P.W. through State Boards for Vocational Education.
Training for teacher trainers.	A comprehensive programme of instruction in the methods, techniques and materials used in efficient instruction.	To train full-time instructors to conduct training programmes.	State Boards for Vocational Education.
Production training for employed farmers.	Short unit training in production of farm commodities, in repair, operation and construction of farm machinery and equipment and in production, processing and conservation of food for family use.	To meet training needs of farmers in obtaining production goals of farm commodities designated by the U.S. Department of Agriculture.	F.W.P.T. through public schools.
Pre-employment training for farm workers and war industry workers.	Short unit training for inexperienced persons as farm workers and preliminary training for war industrial employment.	To prepare inexperienced persons for agricultural employment and to provide mechanical training for persons (for whom war production training is unavailable) who may enter war industry.	F.W.P.T. through public schools.
Pre-employment college-level training for engineers, chemists, physicists, and their assistants (leads to employment).	Comprehensive training in short, college-level courses designed to prepare qualified persons, particularly women and older men, for professional and subprofessional jobs in engineering, chemistry and physics.	To develop professional and subprofessional personnel for specific jobs in engineering, chemistry, and physics; emphasis is on women and older men.	E.S.M.W.T. through co-operating colleges and universities.
College-level war training for engineers, chemists, physicists, and their assistants (for employed workers).	Comprehensive training in short, college-level courses for professional and subprofessional jobs in engineering, chemistry and physics.	To develop professional and subprofessional personnel for specific jobs in engineering, chemistry, and physics.	E.S.M.W.T. through co-operating colleges and universities.
College-level war training in production supervision (for employed workers).	Comprehensive training in short, college-level courses in production and supervisory techniques.	To train specialists to deal with problems of production, organisation, management, labour laws and regulations, etc.	E.S.M.W.T. through co-operating colleges and universities.

[1] A.T.S. = Apprentice-Training Service; E.S.M.W.T. = Engineering, Science and Management War Training; F.W.P.T. = Farm Workers' Production Training; T.W.I. = Training Within Industry Service; V.T.W.P.W. = Vocational Training for War Production Workers.

Trainees and type of training	Scope of training	Purpose of training	Agency providing training[1]
Other services contributing to the training of war workers			
Labour relations.	Assistance in the solution of labour relations problems arising out of training programmes.	To assist employers and employees in the solution of problems of seniority, hours, wages and classification of workers in connection with training programmes.	A.T.S. through field staff.
Recruiting and placing of workers.	Recruiting and placing of qualified workers of all kinds.	To bring together men and jobs to assist in recruitment of applicants for training; to survey personnel needs, etc.	Local employment offices of U.S. Employment Service of War Manpower Commission.

[1] A.T.S. = Apprentice-Training Service.

Industry's in-plant training programmes and the Government's defence training programme worked together to fill the expanded requirements of wartime essential industries for trained workers and the gaps in skill left by the depression in the country's skilled labour supply. Industry, while developing and expanding its own training activities, found the co-operation of governmental training services indispensable; and the public training arrangements worked far more closely with industry than ever before. However, the scope of the war training arrangements was somewhat limited in practice, despite the large numbers of persons trained. When the product of a company was the same as that produced in peacetime, the need for training assistance was usually less acute. The great bulk of wartime training was for the aircraft and shipbuilding industries and occupations related to these industries; this should be kept in mind in considering the long-term effect of wartime experience.

Since the war, many of the wartime programmes and arrangements have faded away altogether. Others have persisted in one form or another. A certain number of new plans have been worked out for the training of war veterans, but these were kept within the framework of existing public and private training arrangements.

As a whole, it is probably accurate to state that the wartime experience of the training of adults for industry has still to be analysed. Its relationship to present problems of American production is not yet clear. In a sense, however, the conditions which the United States wartime training schemes were designed to meet correspond to some extent to those which other countries,

especially in Europe, are now facing, with the exception that short-term training provisions directed towards immediate production must, in order to be a lasting asset, be linked with long-term provisions aimed at the training of sufficient versatile skilled workers in the respective crafts. If, therefore, further information on wartime training in the United States is desired, the International Labour Office will be glad to provide whatever material is available and to bring those seeking the information into direct touch with the agencies or individuals who were responsible during the war for organising or providing the training in question.

The Present Situation

At present, the training programmes of Government agencies and of industry itself are more or less in a state of transition. During the past year, managements and trade unions alike appear to have taken a wider interest in methods of acquiring and applying technical skill. Programmes of in-plant training have been revised and in many cases extended. Federal and State training agencies have been reconsidering the types of assistance which can be provided to help industry carry out its training responsibilities and to ensure the continued existence of an adequate number of trained workers.

As noted previously, the greatest part of the training of workers is done by industry itself and within the industrial plants. Some industries prefer to do their own training, others do their own training but also use the aid of Government training agencies, and still others do not do their own training but use the facilities of local vocational schools for all forms of training apart from the practical training given on the job itself. Each training scheme conducted by industry has a specific purpose : to develop the trained workers needed by the industrial concern in question.

All the Government training activities are designed to supplement these individual schemes and those of various trade unions. They are aimed at encouraging industry to understand its own training needs and at providing any technical assistance which may be necessary and requested by management or labour when establishing training programmes developed by the various plants, industries or trades. These public programmes are operated with the continued technical assistance of training technicians who are skilled either in the training activity as it relates to the job and that portion of the training which is to be given on the job, or in

the related technical instruction or job skills to be provided through the vocational or technical schools or institutes.

Federal funds are provided for the promotion and development of vocational education. These funds are to make financial and technical assistance available to local communities in developing a vocational training programme organised to meet the requirements of the industries of the community. Experience has shown that when a skilled industry has a demand for training and secures public assistance in developing the training that meets its requirements, any additional expenses for financing the programme will be readily assumed by the industry itself after the initial stage of development. Usually, the financial assistance rendered by the industry relates to supplies and equipment and, in some instances, it takes the form of supplementing the instructor's salary. Frequently, the industry will employ a secretary or co-ordinator to take care of the administrative details of the training programme. This financing is often a joint undertaking by the trade organisations representing the employer and the workers. Since the interest and support for a voluntary activity will vary with the demand for trained workers, it is necessary to provide some public funds — whether local, State or Federal — in order to make a continuous training programme possible.

All training activities encouraged by the Government training agencies are planned to meet the specific needs of industry, and for this reason the training offered varies with employment demands. These demands are determined locally with representatives of industry, and, when possible, training is offered to employed workers by means of an apprentice programme for apprenticeable occupations, or by some other form of part-time training or vocational education where the training is conducted partly on the job and partly at a vocational school. In addition to the training conducted directly with industry, local vocational schools offer trade preparatory training to provide some basic skill and trade knowledge to workers seeking to enter a skilled or semi-skilled occupation ; and trade extension courses are available to employed workers who want to improve their vocational skill and knowledge.

The basic problem in the United States is to provide effective training for 260 or more apprenticeable occupations which now require two years or more of job training and related instruction, and to ensure training for as many, if not more, other occupations which require less, but considerable, training to acquire the

necessary occupational competency. To make the training problem more complex, the major portion of the skilled workers are employed in establishments with fifty or less employees, which means that a majority of the skilled workers are trained in the smaller establishments. The larger establishments operate on a sufficiently large scale to justify the establishment of their own training programmes, and many of them conduct extensive programmes, which they consider to be a sound investment and an essential part of efficient management. In many instances, the larger establishments co-operate and participate in the training programmes established in the community and encourage the establishment of an area programme for specific occupations, aimed at enabling all the establishments in the area to train workers efficiently and successfully for these occupations, and at distributing the burden of training throughout the industry in the area.

To render the maximum service possible to industry, Government training activities direct their attention to : (1) securing the co-operation and active participation of the entire industry and of management and labour alike ; (2) co-ordinating the training given with the work experience on the job (this might be preparatory, related, supplementary or trade extension training, in accordance with the progress and needs of the individual).

In more normal times, Government training agencies encourage and promote the types of training that will give the person being trained the maximum versatility in technical skill and related knowledge, so as to provide the greatest degree of flexibility in the labour force and the fullest possible use of employment opportunities.

Since training opportunities are always most extensive and most varied during a period of high employment, great emphasis is placed, during such periods, on the establishment of training that will provide a high degree of skill in all phases of any given occupation.

In normal operating conditions, some industries employ a large percentage of skilled craftsmen, while others, because of the volume and methods of production, provide training to meet specific production requirements. In the latter type of industry, the skilled craftsman is trained to perform the more important functions of production which require versatility in the application of craft skill. The training requirements for operative jobs (*i.e.*, those not done by skilled craftsmen) vary with the skill required for the job and determine the amount of time required to complete the training. Generally speaking, this type of training is most

successfully given on the job under actual working conditions. For some of the more skilled jobs, the training is organised through a planned series of related assignments which provide the progressive skill, job knowledge and judgment required. In periods when and industries where employment is reasonably stable, this training tends to be accepted as a part of the productive effort and varies in proportion to the effectiveness of the level of production and the methods of training used. This type of in-plant training is generally considered by industry as being its own responsibility and a just cost of production. Since the training given is often narrow in scope and the employment opportunities are restricted, Government training agencies consider that this is not training organised primarily for the benefit of the individual worker being trained, and consequently restrict their activities to assisting in the training of skilled craftsmen and supervisors and of workers for the more versatile jobs in the large sector of less skilled industrial occupations. There is one exception to this, since off-hour instruction is offered to employed workers in subjects related to their jobs and for those who wish to improve their job knowledge and skill. This training (generally referred to as the trade extension programme offered in the evenings by the vocational schools) is not directed towards specific job objectives but towards the upgrading of the skills of individual workers.

As suggested previously, the principal difference between the emergency type of training organised in wartime and that normally conducted by industry and by Government agencies lies in the time available for training and the emphasis on the kind of training given. In normal periods of operation, the induction of new workers is accomplished effectively in most plants and industries by means of the on-the-job training given by the supervisors. This often involves a steady progression from the unskilled to the more skilled operative jobs, and there is time to ensure more effective job placement. In such conditions, training for skill and judgment tends to be more effective because the individual worker is surrounded by more competent personnel and is trained under more satisfactory conditions. Since the training for less skilled, operative jobs is not normally considered a training problem, most industrial companies direct their training programmes primarily towards developing a flexible working force and competent skilled craftsmen and supervisors.

In industries requiring a high percentage of skilled craftsmen (such as construction, shipbuilding and repairing, graphic arts

and others) where, from the viewpoint of regular employment for the individual and because of the varied skill requirements of the job, the work can be performed better by craftsmen with a high degree of versatility in the application of the skills of their trade, apprentice training is the core of the training programmes.

The Government training agencies, in working with industry to provide industrial training for employed workers and for those preparing to enter employment, develop their programmes in co-operation with the representative employers' and trade union organisations of each industry. These groups, often through a joint representative committee, provide advice and guidance in regard to the employment trends of the industry, especially in relation to local conditions, the ability of the industry to absorb new workers, the length of the training period, the relationship and kind of job experiences and related school instruction required in the different jobs and occupations, the shop equipment needed for training, and the types of work available in the community to provide satisfactory job training. This fixes the responsibility for training with the industry, and establishes a better understanding of the training needs of the industry and the problems involved in securing this training. It also gives an opportunity to industry to help to maintain a stable group of workers in training which is not directed towards a specific opening in any particular plant. It also provides an opportunity to assist in the financing of the programme, and to ensure that the training given will prepare the trainees satisfactorily for useful employment.

At present, the Federal Government provides leadership and assistance in industrial and vocational training through two main departments of government, the Vocational Education Division of the Office of Education, Federal Security Agency, and the Bureau of Apprenticeship of the Department of Labor, both of which work in close co-operation with the States. The work of both these agencies is described in more detail in the following parts of the monograph. The practice and procedure they follow is to encourage industry to assume the responsibility for training, and to provide those services which are not readily available within industry or which cannot, for practical reasons, be provided by industry.

CHAPTER II

THE FEDERAL-STATE VOCATIONAL EDUCATION PROGRAMME

The training of workers through the public vocational and technical schools is carried out under the Federal-State programme of vocational education. This programme is of special importance in the United States. It constitutes the core of the country's public training activities and of public initiative in this field.

The vocational education programme, organised and operated on the basis of Federal-State co-operation, is comprehensive. It caters for almost every group of workers in almost every form of economic activity. Training is given for several hundred occupations in the major branches of economic activity—industry, business, agriculture, distributive trades and home economics. The programme is based on the use of public vocational schools, of which there are over 1,100 in the country and which are really training centres—equipped with workshops and laboratories as well as classrooms. It also draws upon other training facilities as the need arises. For example, foremen may be trained under the programme through special group discussion courses and conferences ; workers who can most suitably be trained on the job may be trained on the job ; ex-service personnel may be trained in special classes, courses or schools organised to meet their particular requirements ; adults may be trained as well as juveniles who have not yet entered the employment market ; employed persons as well as unemployed persons may make use of the facilities provided under the programme ; and the training of vocational instructors is an integral part of the whole programme. As a whole, therefore, the programme is flexible, both in principle and in application.

Workers seeking vocational training have recourse to a variety of services under the vocational education programme. The training facilities provided for adults and out-of-school youths are described briefly in the following pages, though it is not always easy to distinguish between the facilities provided especially for these groups and those provided primarily for young persons receiv-

ing their initial vocational preparation. A principle underlying the United States programme is to distinguish by the training needs of the applicants for vocational education rather than by their age. This principle directly affects the organisation and operation of the vocational education programme.

Legislative Basis

The general Federal-State vocational education programme is based on a number of Federal Acts. For the purposes of this monograph, the following are of particular importance :

(1) The Smith-Hughes Act, approved 23 February 1917 (Public No. 347, 64th Congress).

This is a basic Act providing annual appropriations for distribution to the States for the payment of vocational education in agriculture, trades and industry, and home economics and for the training of teachers for these fields.

(2) The George-Deen Act, approved 8 June 1936 (Public No. 673, 74th Congress).

This Act authorises continuous annual appropriations for use by the States and Territories in developing vocational education for agriculture, home economics and trades and industries, and also for education in distributive occupations. Some exceptions were made to the conditions of the Smith-Hughes Act. The principal change provided for the matching of Federal funds by the States on a graduated scale, starting at 50 per cent. and reaching 100 per cent. in 1947.

(3) The Vocational Education Act of 1946, known as the George-Barden Act, approved 1 August 1946 (Public No. 586, 79th Congress).

This Act amended the George-Deen Act and contains many new provisions. The amounts of the annual appropriations authorised were increased and expenditures for a number of new phases of work were included.

All of these Acts have the same general purpose—to promote and develop vocational education of less than college grade in schools, and classes under public supervision and control. In the main, the principles and standards included in the first Act—the Smith-Hughes Act of 1917—have been carried over into the new and supplementary Acts, with modifications as required by experience and changing conditions.

Under the Federal legislation (in particular, the Smith-Hughes Act), the following significant legal requirements are imposed on the States:

The State shall—

(a) accept, through the legislature, the provisions of the Act;

(b) designate or create, through the legislature, a State board for vocational education consisting of not less than three members having necessary power to co-operate with the Office of Education in the administration of the provisions of the Act;

(c) appoint, through legislative authority, as custodian for appropriations allotted, its State treasurer, who shall receive and provide for the proper custody and disbursements of all money paid to the State from Federal appropriations.

It is further provided that the State Boards for Vocational Education designated or created as above shall as a general prerequisite—

(a) prepare plans showing:

(1) the kinds of vocational education for which it is proposed that the appropriation shall be used;
(2) the kinds of schools and equipment;
(3) the types of courses of study;
(4) the methods of instruction;
(5) the qualifications of teachers;

(b) submit such plans to the Office of Education for approval;

(c) make an annual report to the Office of Education on or before 1 September of each year on the work done in the State and the receipts and expenditures of money under the provisions of the Act. . . .

In regard to Federal responsibility, the Act provides that the Office of Education shall—

(a) co-operate with State Boards in the administration of the provisions of the Act;

. . . .

(c) examine plans submitted by State Boards and approve such plans if found to be in conformity with the provisions and purposes of the Act;

. . . .

(f) make an annual report to Congress on or before 1 December on the administration of the Act, including therein the reports made by the State Boards, and the expenditure of the money allotted to each State. . . .

Each State has legislation relating to the organisation of vocational education in the State and acceptance of the provisions of the Smith-Hughes Act. The legislation differs from one State to another, but the basic provisions have much in common.

The Federal and State legislation relating to the vocational education of adults is supplemented by administrative regulations,

which lay down training policies and procedures in more detail.

The Federal funds available under this legislation for vocational education may be used only to develop training for certain occupations, specified in the Federal Acts. Many States extend their training programme by engaging in State and local activities for which Federal funds are not used.

The State legislation and regulations on vocational education are based primarily on the special training needs of each State, growing out of its own economic, social and political conditions. The Federal legislation and regulations attempt primarily to ensure, through minimum standards attached to the use of the funds by the States, that the Federal funds are used effectively for vocational training purposes in the national interest. The co-ordination of Federal and State legislation and regulations is achieved primarily through the administrative working relationships described later in this chapter.

Objectives of Training

The Federal-State vocational training programme is aimed at the full and efficient use of manpower resources. It is related closely to the national full employment policy and to the economic and social goals set by Congress in the Employment Act, 1946, and in other measures of national policy affecting full employment and social welfare.

The purpose of the programme is to provide training to develop the skills, abilities, understandings, aptitudes and appreciations needed to enter and make progress in employment on a useful and productive basis. Its basic practical aim is to fit persons for useful employment.

The major objectives of trade and industrial education are the following :

(1) to provide instruction (of an extension or supplementary type) for the further development of performance skills, technical knowledge, related industrial information, safety and job judgment, for persons already employed in trade and industrial pursuits ; and

(2) to provide instruction of a preparatory nature in the development of basic manipulative skills, technical knowledge, and related industrial information, safety and job judgment, for the purpose of fitting persons for useful employment in trade and industrial pursuits.

These objectives are attained through several types of programmes. Each programme is specific in purpose and is designed to serve the training needs of individual industrial workers at various levels.

Estimation of Training Requirements

No accurate or precise estimates can be made of the numbers of adults to be trained under the long-term programme, since many factors affect the number likely at any given time to be seeking training or retraining. The primary factor influencing the demand for training appears to be the volume and character of openings for employment.

The Federal Office of Education and many, if not all, of the State Boards of Vocational Education regard the accurate determination of training needs as one of the basic steps in setting up and operating a programme of training for adults in any field. In their view, the process of fixing training requirements, nationally and locally, calls for a thorough knowledge of employment opportunities and also for keeping up to date, and in readily usable form, factual information on manpower requirements and specific job requirements, and on changes in employment conditions. To a large extent, existing material on occupational trends and current employment market information (including a classification of the unemployed population and detailed and precise estimates from employers of their need for workers) provide the basis for determining the size and scope of training programmes for adults under the Federal-State scheme. Detailed data on training requirements are available in a number of cities and towns through local studies, which are based on a comprehensive survey of local business and industrial activities and trends.

The usual procedure for determining training needs in the United States is to conduct an occasional survey, generally of a statistical type, in which many of the data are taken from compilations made for other purposes. The Office of Education warns against reliance on this conventional procedure on the following grounds :

> It often happens that the net result of an expensive and elaborate statistical survey is little more than another book to be added to the library shelf. The trouble with many surveys of the general type is that they are superficial so far as their value in planning a programme of vocational education is concerned. This means that they do not get down to brass-tack facts that have a functional value in connection with the organisation of a programme. From the standpoint of industrial and business education it is important to know a great deal more about the work carried on than can be ascertained by sending survey agents into industrial and business establishments with questionnaires, forms and notebooks.[1]

[1] Vocational Division Bulletin No. 223 : *Community Occupational Surveys*, by M. Zapoleon (Washington, 1942).

While survey information is important for the training of adults, the Office of Education urges that it should be supplemented by procedures for securing specific information covering the needs in each individual occupation. Two methods are recommended as being theoretically sound and practically effective : (1) the conference survey ; and (2) foreman, supervisor or leader training.

The conference survey is based on conferences of employers and trade union representatives, meeting under the auspices of local vocational education authorities. Representatives of each trade participate in the discussion, which is directed towards making a detailed analysis of the local situation. The conclusions are drawn up in the form of recommendations to the local educational authorities. This type of survey, when well organised and carried out, is considered to have the advantage of providing valuable and up-to-date detailed information on training requirements and of promoting the co-operation of employers and workers with the vocational training scheme.

The second method is that of systematically obtaining information on training needs from supervisory personnel, through the programme for training such personnel and particularly through conferences of foremen. It is stated that such conferences are likely to produce specific and detailed information on training requirements, of a kind not likely to be obtained through any type of survey.[1]

Categories of Trainees and Types of Training

Vocational training provided under the Federal-State programme is designed for persons over 14 years of age who are preparing for or have entered the various occupations. It is emphasised that training opportunities should not be restricted to young persons enrolled full-time in the regular day-schools, but should be extended to serve all out-of-school youth and adults, both employed and unemployed, who need the kinds of specific training which can best be provided in organised classes.

The Office of Education takes the view that " in the years ahead many more adults can and should be reached through vocational education than in the pre-war period ".[2] For this

[1] Cf. Vocational Division Bulletin No. 234 : *Vocational Education in the Years Ahead* (Washington, 1946), pp. 91-93. This is the report of a committee appointed to study post-war problems of vocational education, but its conclusions accord with Office of Education policy in all major respects.

[2] *Ibid.*, p. 65.

purpose, it considers that a greater diversity of courses and types of training will be necessary. For those who wish for training supplementary to their jobs, the aim is to equip the vocational schools to provide a comprehensive programme, including manipulative and technical training for production workers and appropriate courses for supervisory and administrative personnel. For those preparing for new jobs, greater attention is being given to such factors as the transferability of skill from one job or occupation to another, the new skills required, the organisation of training in short " unit courses "[1], and the arrangement of these courses to enable adults to receive training and enter employment in the shortest possible time. Training facilities for adults continue to include upgrading training, to enable them to move to higher levels of skill and responsibility. This training is being organised in short unit courses and is based on previous experience and additional job requirements ; to make it effective, efforts are being made to ensure that it is developed and carried out in the closest co-operation with management and labour. For unemployed adults, training is more diverse in form than ever before. Greater regard is paid to such factors as existing local employment opportunities, on the one hand, and the age, physical condition, previous education and work experience, interests and aptitudes of the person concerned. Training may be provided for this group, as appropriate in the individual case, through evening courses, apprenticeship, short intensive courses, all-day trade classes and co-operative part-time courses (part-time school attendance and part-time work in industry).

The training provided under the Federal-State programme must be of " less than college grade ". A programme is under college grade when —

(*a*) its objective is to provide training to prepare for or to advance in or continue in employment in specific occupations or fields of work ;

(*b*) admission is based on the ability of the trainee to profit by the instruction rather than on his educational attainment ;

(*c*) the instruction is based on the needs of workers in the occupation for which the training is given ;

(*d*) the training is not part of a course to be continued in colleges or other higher training institutions ; and

(*e*) the training does not lead to a baccalaureate degree and is not organised to conform to the requirements of a course leading to such a degree.

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[1] See below, p. 40.

Public Supervision or Control

One principle common to all the training carried on under the Federal-State vocational education programme is that the training " shall be given in schools or classes under public supervision or control ". This condition is fulfilled if—

(*a*) the training is organised and operated under a public authority;

(*b*) the instructors are paid from public funds;

(*c*) the training is administered, controlled and supervised in all details by officials on the staff of a State or local board responsible for vocational education, including the selection and conditions of appointment of the instructors, the qualifications and admission of the pupils, and the content and organisation of all courses and curricula.[1]

General Administrative Organisation

The Federal Government does not operate vocational schools or classes but provides assistance to the States for vocational education purposes. Thus, the States have the primary responsibility for developing and operating vocational education schemes. The programme is based on certain fundamental ideas, namely:

(1) that training is a matter of national interest and essential to the national welfare;

(2) that Federal funds are necessary to stimulate and assist the States in making educational provision for such training;

(3) that since the Federal Government is vitally interested in the success of vocational education, it should have a degree of participation in the work; and

(4) that only through co-operative Federal-State working relationships can better and more uniform standards for vocational training be maintained.

Federal Administration

At the Federal level, the United States Office of Education, in the Federal Security Administration, is the agency responsible for the administration of appropriations made available for training under the Federal and State Vocational Education Acts. This responsibility is exercised through its Division of Vocational Education, headed by an Assistant Commissioner for Vocational Education, who works under the Commissioner for Education.

[1] The local vocational school authorities arrange this with the advice of an industry committee.

The activities of this Division (most of which require close co-operation with the State authorities) fall under the following main heads :

(1) assisting the States to determine training requirements on the basis of occupational opportunities and trends ;

(2) assisting the States to plan, organise and administer their training programmes and to improve training methods ;

(3) assisting the States to develop instructional materials and standards for the training facilities ;

(4) assisting the States to select and train instructors, supervisors, administrators and other personnel necessary for the training programmes ;

(5) assisting the States to evaluate their training programmes ;

(6) administering the national programme in accordance with the provisions of the Federal Acts on vocational education ; and

(7) co-operating with public and private training agencies operating on a national or interstate level.

The Division of Vocational Education has five services (in addition to administrative staff): an agricultural education service, a business education service, a home economics education service, an occupational information and guidance service and a trade and industrial education service. Each of these services has a chief, an assistant chief and a number of specialists working in co-operation with the States on programmes in their respective fields.

The Trade and Industrial Education Service works with the States in such ways as the following :

(1) assisting the States to determine industrial training needs for industries, occupations and communities ;

(2) helping to set up schools and classes to meet these specific needs ;

(3) co-operating in organising training for instructors ;

(4) providing special advisory services to overcome training problems arising for particular groups or occupations ;

(5) conducting national or regional conferences to examine common training problems ;

(6) assisting the States to establish and maintain suitable standards for trade and industrial classes ; and

(7) co-operating with other public and private agencies in making studies designed to help develop more adequate trade and industrial training.

State Administration

At the State level, each State is required by the Federal legislation to submit an annual plan for the vocational education

programmes on which it expects to spend Federal money. This plan must be approved by the Federal Commissioner for Education, and it then becomes a contract between the State and Federal Government. The plan is initiated by the State and is federally reviewed only as its provisions apply to the use of Federal funds, and, within that limit, only in so far as its provisions are contrary to Federal legislation or clearly established administrative regulations made under that legislation.

The State Boards for Vocational Education are the responsible State agencies under the Federal-State programme. Among other things, the Boards make annual reports to the Office of Education on the training work done during the year.[1] A standard outline for this report is provided by the Federal Office, but the States have considerable latitude in determining its substance.

The Federal legislation provides that funds to the States may be used for assistance in maintaining adequate administration (at the State level, and locally as well). As a rule, the administrative staff of a State Board includes an executive officer, a State director and persons specialised in promoting or administering the programme in each major field of training. The State supervisory staff usually includes a State supervisor for each of the major fields and the professional and clerical workers needed for supervisory duties. Such a staff sometimes includes specialists on adult training. The other branches of the State administrative organisation are, as a rule, those concerned with the training of teachers, equipment and research.

Local Administration

At the local level, administrative responsibility lies with the local board of education, which may have a separate division of vocational education. The planning, establishment, administration and supervision of vocational programmes are functions of the board. Frequently, the local administrative organisation is on the pattern of the State administration. There are a local director and local supervisors of vocational education and local teacher trainers.

The local director is the person responsible for developing a local programme of vocational training and for co-ordinating the work of the local supervisors. Federal funds may be used towards

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[1] A summary of these reports is published regularly by the U.S. Office of Education, in *Digest of Annual Reports of the State Boards for Vocational Education*.

the salary and travel expenses of the local director, provided that he meets the following minimum qualifications :

(1) practical experience in one or more of the fields of work covered by the programme he is directing ;

(2) teaching experience in a vocational programme meeting State standards ;

(3) supervisory experience in vocational training meeting State standards ;

(4) technical and professional education, which includes a study of the philosophy and administration of vocational education.

The duties of a local supervisor of vocational education are essentially the same as those of a State supervisor, except that they are confined to a local area. He is responsible for generally controlling the vocational training programmes carried out by the vocational schools and classes in the area.

Advisory Committees

The maintenance of advisory committees for vocational training is considered a fundamental condition of the efficient operation of vocational programmes. As a rule, the advisory committees advise on the over-all programme and on its different aspects, including the training of adult workers, and are not set up especially to assist in developing or improving programmes for adult workers.

The principle underlying the composition of advisory committees is that they should be representative of the major groups interested in vocational education. As a rule, the committees include representatives of employers and workers, and this is considered essential in trade and industrial training. In practice, most of the advisory committees in this field consist exclusively, or almost exclusively, of such representatives.

The majority of the State plans for vocational training provide for the organisation of advisory committees at both the State and the local levels. The State Boards for Vocational Education have representative advisory committees, which provide advice regarding the over-all State programme. In the local communities, advisory committees are maintained to advise and assist in developing, planning and establishing schools and classes to meet vocational training needs. Several types of representative committee are used. A general advisory committee may be set up as a representative group advising on the whole programme in any State

or area. A craft committee is an advisory committee concerned with training for a particular craft or trade. An industry committee advises on training for the whole industry. Thus in some of the States there are general advisory committees, while in others representative committees are set up for the various branches at the State level and also in a number of the communities within the State. State and local authorities were urged to include explicit provision for such committees in the new five-year plans which they submitted to the Federal Office of Education in 1947. Local communities are strongly recommended to set up and use craft or occupational committees for each field in which training is given in the community.

The chief function of the advisory committees is to make recommendations to the administrative authorities on policies relating to vocational training. As a rule, the committees are responsible for studying training needs (of industries and of individuals), appraising State and local plans for the operation of training programmes, and evaluating training methods. The committees are warned against assuming administrative authority or attempting to interfere directly with the operation of the training programme on which their advice is sought. In practice, the advisory committees perform many varied tasks. For example, one aspect of training on which their advice has been especially useful is in helping to estimate or determine the need for training. Many of them have often been in a position to suggest modifications of school training methods with a view to bringing them into line with methods used in the various industries and trades. A number of the committees have been called upon to help in planning the adaptation of vocational school facilities to meet the needs of returned service personnel or displaced war workers. Finally, many of the committees have given valuable help with respect to the technical equipment of vocational schools and, in some cases, to the content of the curricula for the different courses offered.

The Office of Education is engaged in setting up, at the Federal level, a representative advisory committee for each service of vocational education, including trade and industrial education.

The Representative Advisory Committee for Trade and Industrial Education will counsel the chief of the Trade and Industrial Education Service regarding such matters as training needs, and the meeting of such needs, and will in addition assist the service in a consultative and technical capacity.

Relations with Employers' and Workers' Organisations

Throughout the United States the relations between the vocational training authorities (Federal, State and local) and management and labour groups are very close. The formal connection of these groups with the training programme is generally established through advisory committees, the composition and activities of which have been sketched above. In several States, moreover, the State Board of Vocational and Adult Education is composed of employers of labour, skilled workers (other than those with the power to employ or discharge labour) and practising farmers.[1]

Informally, there are many and varied forms of management-labour co-operation in the training programme. Representatives of employers' and workers' organisations attend training institutes and conferences at all administrative levels. They act as consultants for particular aspects of training (such as the selection and placement of trainees). Particular importance is attached to the value of informal consultation in the organisation of training, full-time or part-time, for adult workers. Their representatives are often called upon to give advice on industrial or labour problems likely to arise in the organisation of adult training programmes through the vocational schools, and on the co-operation which the vocational schools can give in the promotion of in-plant training and in providing supplementary instruction to employed adult workers. Since the war, increased emphasis has been placed on employer-worker co-operation in the Federal-State programme of vocational education. More than ever before, it is recognised that the practical value of the training provided depends in part on this co-operation. In many States the vocational school authorities have therefore broadened the scope of management and labour representation in the training programmes, and have increased the responsibilities of these representatives in the fields where their

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[1] A pamphlet issued by the State Board of Vocational and Adult Education of Wisconsin particularly emphasises management-labour co-operation in vocational training in the following terms:

> One of the reasons why labour and employers have always been interested in the vocational schools of Wisconsin is because theirs are the only educational boards required by law to have as members two representatives employers and two representatives employees who have no employing or discharging power and who are not foremen or superintendents. This feature, more than anything else, has spelled success for the movement since it started in Wisconsin. (*Continuing Educational Opportunities through Wisconsin Schools of Vocational and Adult Education*, Madison, Wis.)

advice is sought and given. In some States employers' and workers' representatives have been called upon to participate in a thorough overhaul of the State training programme, including the relationship of the vocational school network to the other training facilities provided within the State. In most States there is a close working relationship between the Federal Trade and Industrial Education Service staff and the officials of the State Labour Department, State federations of labour, manufacturers' associations, employers' organisations, State Apprenticeship Council and field representatives of the Federal Apprentice Training Service.

General Organisation and Methods of Training

The general organisation and methods of training of adults under the Federal-State programme of vocational education are described briefly under the following main heads :

(a) short unit all-day trade courses for adults ;

(b) extension or supplementary trade training for employed workers (day and evening) ;

(c) co-operative on-the-job training ;

(d) technical-vocational training for industrial occupations ;

(e) training for administrative, supervisory or foremen personnel ;

(f) training of vocational instructors.

All-Day Trade Courses for Adults

Under the all-day trade training courses in the vocational schools, there exists what is known as a " Type C " course. This is a special type of all-day pre-employment trade course for persons over 18 years of age or for those over 14 who have legally left full-time school. The training may be offered for any length of time. The George-Barden Act specifies that such classes may be operated for less than 30 hours a week, and that they need not comply with the usual requirement that a minimum of 50 per cent. of the school time must be given to shop work on a useful and productive basis. The purpose of these provisions is to meet a number of different situations, such as a demand by industry for the training of single-skill operators which can be met through a short intensive training course, or a demand by adults wishing for brief preparation for entering industrial employment at the beginning level.

Selection.

Admission is restricted to persons physically and mentally able to profit by the instruction received. Selection is carried out by the individual vocational schools. In some cases, tests are used to determine aptitude for particular courses of training. Type C courses, as noted above, are limited to persons over 18 years of age or those 14 years of age or more who have legally left full-time school. In some localities and in some trades, lack of facilities limits admission.

General Character of the Courses.

Intensive courses for adults operate 6 to 8 hours a day for relatively short periods of time (varying with the trade or occupation for which training is being given). They are organised to prepare adults to take up an employment in which the specific requirements are of such a nature that the equivalent of the training would enable a person to enter the industry and meet the explicit requirements of the job in question. The all-day trade training courses are not designed to turn out fully trained workers in any skilled occupations, but through them the workers are given opportunities to develop some of the skills and to acquire some of the related knowledge needed by competent and successful workers in the trade for which they are preparing. Preparation for jobs requiring special testing or inspecting skills may be included as locally necessary.

Unit Trade Courses.

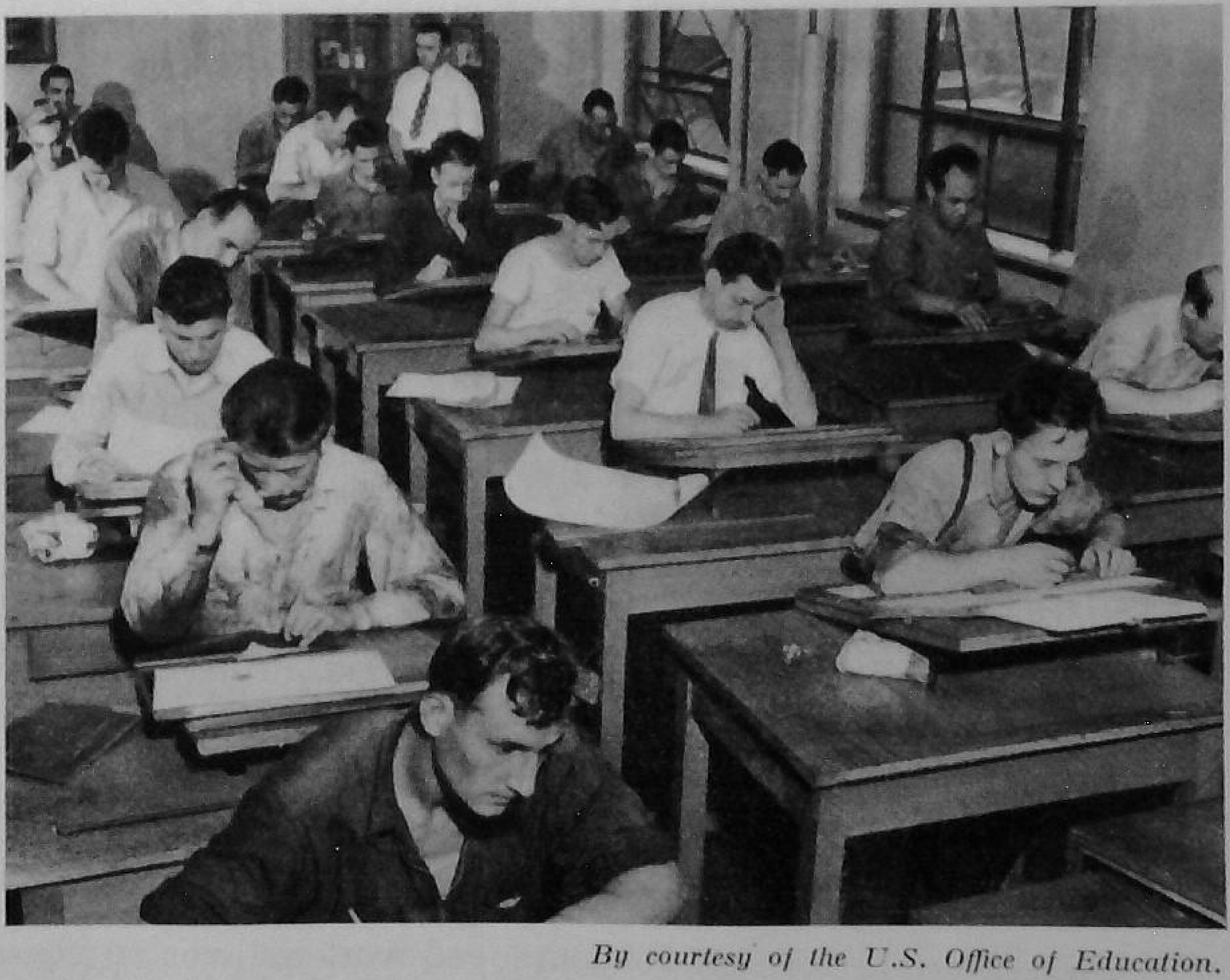
The term "unit trade course" is used to describe instruction organised for young persons or adults attending a full-time vocational school to prepare for entry into a specific trade or industrial occupation. This training is given to groups or individuals who have already selected the occupation for which the course is organised, but can profit by the instruction and expect to use the skill gained in earning a living. Unit courses are based solely upon instruction for a particular trade or occupation. For example, a unit trade course may be established for a group of workers preparing to enter the trade of auto-mechanic, custom dressmaker, carpenter, machinist or printer.

General Industrial Courses.

A general industrial course is organised for young persons or adults to provide specific preparation for a single occupation. It

By courtesy of the U.S. Office of Education.

Trainees learning to operate horizontal and vertical milling machines.



By courtesy of the U.S. Office of Education.

Class in mechanical drawing.

is so arranged that the workshop instruction in several closely related trades may be conducted at the same time, and is thus adapted to the needs of a small community where unit trade courses would be difficult to set up for a variety of trades.

General industrial courses are also organised for production jobs which do not fall within the standard trade classifications, to prepare workers for such industrial jobs as those of assemblers of small parts, punch press operators, coil winders, drill press operators with jigs and fixtures, or inspectors or testers. They receive training in such industrial processes as soldering, spot welding, drilling, forming, assembling, etc. This type of course is designed for training for entrance into employment in an industry rather than for entrance into a trade.

Practical Work.

Instruction in practical work is considered to be "on a useful or productive basis" when it consists of organised systematic training in the processes involved and when it is selected with regard to suitability and the quality, quantity and methods of production customarily observed in the trade or industrial occupation for which the training is being given. The work projects are those which have real training value and which are comparable to the ordinary practices of industrial establishments, with due regard to the quality of work done, the time taken and the methods of work used.

Related Subjects.

Theoretical classroom instruction, related closely to the practical shop work, is provided to adults in all-day trade training courses. The amount varies with the trade being learned ; as a rule, about one third of the total training time is directed to related instruction. The subjects taken also vary with the trade requirements ; typical examples are, for machine shop trades, applied mathematics, carpentry and reading of building blueprints ; for cooks and bakers, elementary sanitation and nutrition ; for printers, shop layout and measurements. The related subjects are often taught by the shop instructor. In all cases, properly qualified and experienced instructors must be provided.

Supplementary Training for Employed Workers

Supplementary training for employed workers over 16 years of age is provided under the Federal-State programme in order to

increase the worker's skill or knowledge in the trade or industrial pursuit in which he is employed. The training may improve his ability in his own work, it may help him to keep up to date in his trade or occupation, or it may assist him to qualify for advancement in his chosen field of work. In may include manipulative or technical training as well as a study of safety, labour legislation and the socio-economic problems of the occupation.

In some cases, the training is provided through short unit evening courses, given in classes outside the trainees' working hours and in any premises with adequate teaching facilities, most often in the local vocational schools. Evening class trade instruction may be for 144 hours per year or more, or the course may be shorter and organised as part-time classes. In practice, the courses range from as little as 10 hours in length to a seldom exceeded maximum of 200 hours in any school year. Usually, these trainees attend two-hour classes on two evenings per week.

Part-time classes (in the daytime or in the evening) are offered for employed workers over 16 years of age in three main forms. Firstly, part-time trade extension classes are offered for the purpose of increasing the worker's skill or related knowledge in his trade or occupation. These classes include related instruction for apprentices, for workers employed in semi-skilled, specialised or other industrial occupations and for persons employed in industrial work in public service occupations. One special form of trade extension training is that of co-operative classes, organised to provide alternate periods of work and school attendance, with the hours at work equalling those spent at school. Secondly, trade preparatory instruction, given in part-time classes, is provided for workers who have left full-time school and who are preparing to enter an occupation other than that in which they are employed. Such instruction may be offered to a number of groups in different trades and industrial occupations, but in all cases the group instruction is limited to a single occupation. After the worker so prepared changes his occupation, his preparatory instruction may be followed by the part-time trade extension training noted above. Thirdly, general continuation courses are provided on a part-time basis for the purpose of broadening the civic or general vocational intelligence of employed workers.

Extension or supplementary training is open, on voluntary application of the persons seeking the instruction, to workers employed in the trade or occupation for which the training is organised. It is offered for groups which seldom exceed 25 in

number and which are often limited to 10-15 persons if the nature of the particular instruction makes this necessary or desirable. The content of the course is worked out from a careful analysis of the occupation and fits in directly with the work in which those enrolled in the course are engaged. New courses are organised from time to time as the need arises. Each course is operated only until its particular objective has been met.

Evening class instruction (the most common type) is usually given by instructors employed during the workday in the industries or occupations for which they are engaged to teach, on a fractional time basis, at the evening vocational school. The Trade and Industrial Education Service considers that, more than in most kinds of training, the effectiveness of this type of instruction depends upon the proper selection of competent instructors, thoroughly practised in the trade or occupation in which they are instructing. The instruction is organised in intensive and self-contained units, and the instructors are versed in the use of special adult education procedures.

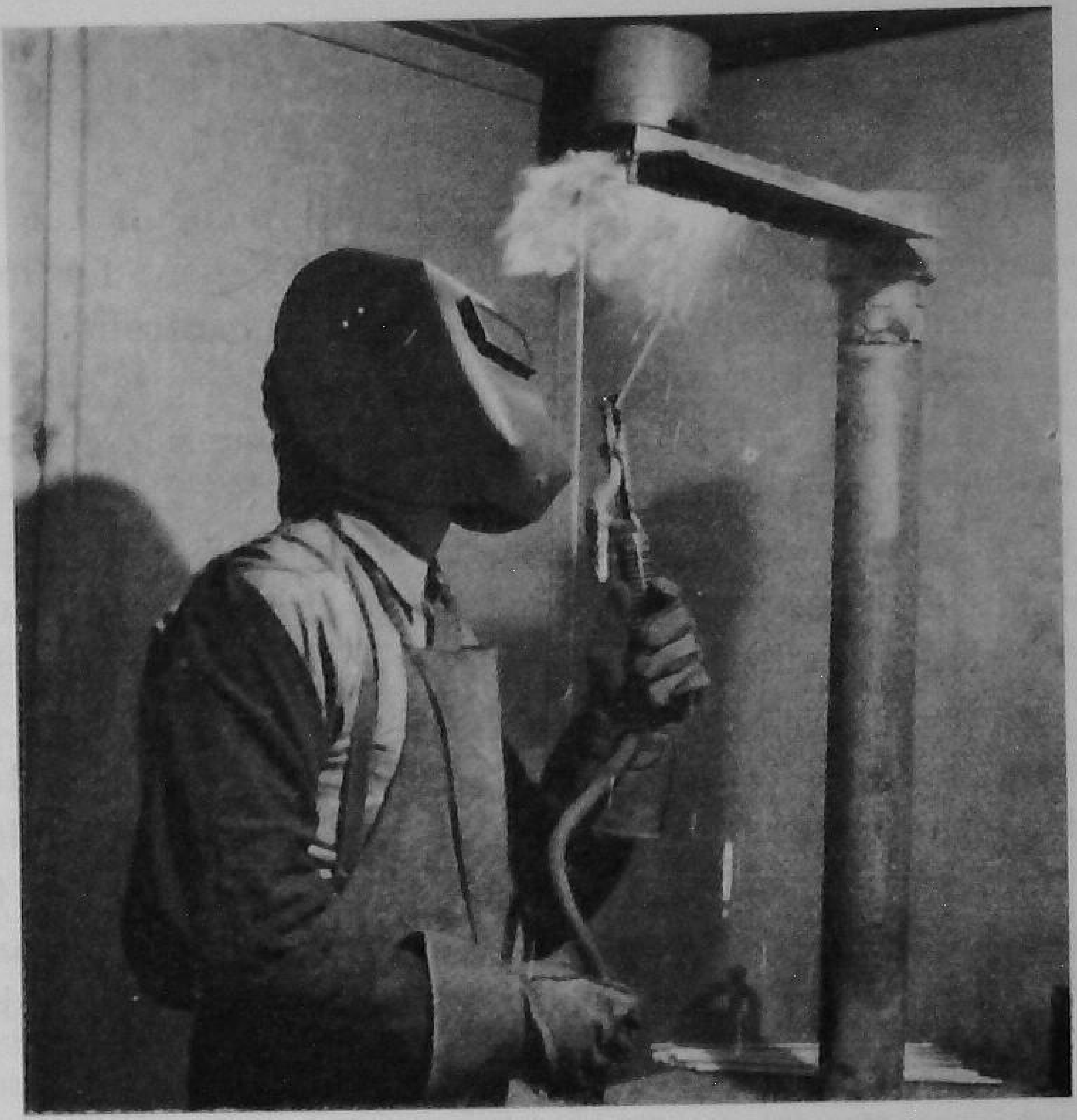
The evening vocational school in a large city will operate several hundred different courses in several different sections during any one school year and will enrol over 10,000 workers.

The following table shows the number of persons receiving instruction in all-day trade courses and in evening or part-time classes :

ENROLMENT IN VOCATIONAL TRADES AND INDUSTRY CLASSES, FISCAL YEAR 1947

Type of class	Number of trainees		
	Male	Female	Total
All-day	186,956	30,297	217,253
Evening	108,128	8,653	116,781 [1]
Part-time :			
Trade extension	269,836	22,901	292,737 [1]
Co-operative	12,224	11,497	23,721
General continuation	37,515	32,091	69,606
Total	614,659	105,439	720,098

[1] These two figures include a total of 143,866 apprentices who received instruction in evening and part-time classes, and 79,523 of whom were apprentices registered with a State Apprenticeship Council or the Federal Committee on Apprenticeship (see Chapter III).



By courtesy of the U.S. Office of Education.

Overhead welding.

By courtesy of the U.S. Office of Education.

Training in aircraft riveting and bucking up.

Plant Training under the Federal-State Vocational Education Programme

The George-Barden Act provides that none of the Federal money appropriated under the Act may be spent for industrial plant training programmes, unless such plant training is *bona fide* vocational training and not a device to utilise the services of the trainees for private profit. It was considered useful to make this provision because the public schools could not themselves provide all the equipment and variety of work experience needed for good training in many occupations, whereas such equipment and experience could be obtained through local industries. In these circumstances, the public vocational schools may use the necessary private facilities for public vocational instruction, provided that these training facilities are made available under fixed public standards and safeguards ensuring proper training operated for the benefit of the trainees. The standards and safeguards approved as official policies by the Office of Education are as follows:

The use of Federal funds is justified when the school system is enabled to provide training in the public interest and that of those being trained, which it could not otherwise provide for want of the equipment and supplies available in the plant, providing the following requirements are met:

(1) The programme must be under public supervision or control, as evidenced by—

(*a*) the fact that the local school officials have furnished satisfactory proof to the State officials that—

(i) the training is organised and maintained in response to public need;

(ii) the interest of the persons enrolled in the training programme is the chief consideration;

(iii) the programme is generally recognised as a part of the public school work of the community;

(iv) the determination of matters such as the selection, qualifications, and salaries of teachers; content and length of courses; admission of students; supervision of instruction, and all other details of the training programme are vested in officially designated school officials who recognise and admit their responsibility;

(*b*) the fact that the teachers engaged in training in the industrial plant are being paid by the same procedure and through the same sources as such teachers would be paid if teaching in public school buildings.

(2) There must be a definitely organised plan of instruction, which shall include the technical knowledge and related industrial information,

based on the standard practices of the trade or occupation, to ensure adequate knowledge and mastery of the machines or operations, and orientation of the worker.

(*a*) Every State which is either operating or contemplating establishing training at public expense in industrial education should have a State Advisory Committee, composed of equal representation of outstanding representatives of employers and outstanding representatives of labour, to advise the State Board for Vocational Education on all matters relative to such training in industrial education.

In addition, where possible, it is strongly urged that the whole programme, rates of pay, etc., should be worked out by a local representative committee. Such a local representative committee should be appointed by the school authorities to advise on all phases of the programme. The Committee should include at least three employers, not more than one of whom represents the industry or plant affected, and at least three representatives of labour, not more than one of whom represents the industry involved.

(*b*) The training courses should be in general harmony with the time customarily given by industry to breaking in for payroll jobs such as are to be covered in the training programme, making allowance for the extra time needed to teach related subjects. The training programme should be checked against actual job requirements in the plant, and any accepted time standards for training for such jobs, before approval is given.

(*c*) Training at public expense should stop with the completion of the learning stage—the formation of automatic habits of correct procedure.

(3) The programme must meet all of the remaining requirements of the State plan, as attested by a sworn statement from an administrative official of the school organisation, to the effect that all conditions set up in the State plan have been met.

(4) Where plant employees, such as mechanics or other qualified skilled workers, are used as instructors, there must be a definite division of duties between instruction and plant activities, by definite time periods. In no case may any portion of the time of a plant foreman or supervisor, during his regular working day, be reimbursed from Federal vocational education funds because of his having devoted such time to the giving of instruction.

(5) Persons are to be paid as instructors only in case they are working with a group of persons who are in a recognised learning status and for whom a regularly organised plan of instruction, as defined in paragraph (2) preceding, is given.

(6) A full statement of each instructor's qualifications must be kept on file in the State office, as evidence that such teacher meets the requirements of the State plan.

(7) Evidence should be on file in the State office to show that the work has been adequately supervised.

The use of Federal funds is not justified when the preceding conditions cannot be met. In addition, Federal funds should not be used in connection with training programmes possessing one or more of the following characteristics, for the reasons stated in connection with each :

(1) where the training programme is for the purpose of the initial training or breaking in, for a specific plant, of workers not previously employed in the industry, no matter whether the demand for training the new workers arises from plant migration or relocations, labour turnover or replacements[1];

(2) where training is confined to manipulative operations and processes, with no provision for teaching the technical knowledge and related industrial information based on the standard practices of the trade or occupation, to ensure adequate knowledge and mastery of the machines or operations, and orientation of the worker; hence training for specialised machine tending where only physical dexterity and speedy muscular co-ordination are required for the worker to hold his own in the production line should be treated as the responsibility of the industries requiring this training, to be carried out at their expense at the time of actual placement;

(3) where training is confined to a single operation, to develop high production speed, extended over the period of time necessary to bring the operative to full piece-rate ability;

(4) where plant foremen, mechanics, or skilled workers are paid from public funds for giving casual instruction on the job incidental to the regular run of production;

(5) where a disproportionate amount of time is spent on manipulative training, in comparison with related technical subjects, in a standard production industry, where it cannot be justified by a check against the actual job requirements of the industry, any accepted time standards of training for such jobs or legitimate training objectives;

(6) where the training period is far in excess of that customarily given by industry itself for payroll jobs, where it cannot be justified by a check against the actual job requirements of the industry, any accepted time standards for training for such jobs or legitimate training objectives;

(7) where the training is extended over long periods of time on regular production work, without pay or at reduced pay;

(8) where an investigation of the programme itself discloses that the objectives and the operation are such as to result in subsidising industrial production, rather than in providing training for the workers' benefit;

(9) where those to receive the training are required to sign an agreement which, in effect, seeks to enable an employer to evade or violate some State or Federal labour law.

Vocational-Technical Training

Vocational-technical training for industrial occupations is provided under the Federal-State programme for persons who

[1] "An employer should expect to invest in the training of his workers, the same as in bricks and mortar, machines and tools in any community where he locates his plant and expects to make a profit. Since the cost of initial breaking in of factory operatives has always been carried by industry as a legitimate part of the cost of production, it follows that Federal funds should not be used in this connection, as it would be subsidising industrial production, which would be contrary to the purposes of the national Vocational Education Acts."

work on jobs which require more limited technical competence than that of the fully trained engineer and scientist and, in many cases, less manipulative training than is required of the skilled mechanic. A considerable expansion of this type of training is now under way.

The current emphasis on vocational-technical training is explained as follows by the Office of Education in the bulletin *Vocational-Technical Training for Industrial Occupations* (which constitutes the best source of published information concerning this type of training) :

The rapid expansion of technology is creating new needs for training. New materials, new processes and new products are being developed at increasing rates. Demands of the war for trained technicians have stimulated new training programmes. The normal initial age of employment is rising. Enrolment is increasing in most types of educational institutions when viewed from long-term trends. Patterns of vocational training programmes are changing with increasing consideration being given to training for "families of occupations". Adult education is increasingly needed in a population in which the average age is rising. All these factors affect the need for vocational-technical training.[1]

Moreover, a survey of industry has indicated a growing need for technicians and for training facilities for them. The results showed an average ratio of 5.2 technicians needed for each engineer, with a range of ratios going as high as 20 to 1 in lumbering and wood processing and 13.6 to 1 in shipbuilding.

The objective of vocational-technical training is the training of technicians for, or their upgrading in, occupations for which professional engineering training is not required. These occupations are classified into the following categories :

(1) engineering aides and science aides, such as drafting specialists and laboratory assistants, requiring a year or two of pre-employment training ;

(2) technical specialists or limited technicians, such as certain types of inspectors, who can be trained in relatively short pre-employment courses ;

(3) technical production and maintenance supervisors, who must have a background of industrial or trade experience, plus supplementary technical and supervisory training ;

(4) semi-technical men, such as technical salesmen or factory accountants, who need technical training in addition to that of some other type.

The vocational-technical programmes take the form of supplementary training for employed workers, with unit courses fre-

[1] Vocational Division Bulletin No. 228 (Washington, 1944), p. 13.

quently combined into longer courses ; full-time pre-employment or pre-production training ; and part-time co-operative training. A large part of the training, reckoned in numbers enrolled and trainee-hours of instruction, is given in supplementary or extension courses for employed workers as compared with full-time pre-employment training. Courses are offered in technical institutes and some technical high schools and trade schools, in terminal curricula in junior colleges, plant training programmes of various companies and engineering college extension courses, and in correspondence schools or institutes. The courses run from a few days to several years. Pre-employment courses are commonly one to three years in length ; supplementary courses vary from a single unit course of several days or weeks to a course made up of integrated units given on a part-time basis over several years. The methods of teaching are direct, with strong emphasis on practice as distinct from formal classroom instruction and book study. Instructors of vocational-technical classes are recruited primarily on the basis of practical work experience, technical industrial knowledge, related scientific knowledge, personal qualities and ability to teach others effectively. For many supplementary courses, the instructors are drawn directly from industry and employed for instruction work on a part-time basis.

The following steps are recommended in planning a vocational-technical programme :

(1) Secure the co-operation of interested groups.
(2) Create a representative advisory committee.
(3) Make industrial surveys to determine needs.
(4) Make surveys of present educational facilities in the field.
(5) Determine desirable administrative and programme patterns.
(6) Make occupational analyses to determine curriculum content.
(7) Construct the curricula.
(8) Determine plant and equipment needs.
(9) Set up standards for personnel.
(10) Obtain the needed financial support.
(11) Secure the personnel.
(12) Publicise the programme.

The following is a summary of the conclusions reached by the Consulting Committee on Vocational-Technical Training in 1944[1] :

(1) The present situation in industry warrants a large expansion of vocational-technical training programmes.

[1] Vocational Division Bulletin No. 228, *op. cit.*, pp. XIX *et seq.*

(2) The occupations requiring vocational-technical training in large or small amounts appear to include four groups : engineering aides and science aides requiring a year or two of pre-employment training ; limited technicians requiring relatively short training ; production and maintenance supervisors requiring industrial background, plus supplementary technical training ; and persons in semi-technical jobs which require combinations of technical and other training, such as selling or accounting.

(3) The occupational analyses developed in connection with this study reveal various levels of technical needs of workers, indicated by the range of technical content, amount and quality of underlying science and mathematics needed for the job, and the length of training required to attain competency.

(4) Industrial surveys made in connection with this study indicate an average need of 5.2 technicians for each engineer, with a range of ratios from 2 to 1 to 20 to 1.

(5) The geographical field in which vocational-technical training now finds a place of usefulness is widening.

(6) Many different types of educational institutions and programmes now provide training of vocational-technical character.

(7) Although some excellent vocational-technical training is now being provided in technical high schools, a trend appears to be towards the post-high-school years.

(8) Institutions providing vocational-technical training should combine evening departments with day programmes wherever this is feasible.

(9) Evening and other part-time programmes of supplementary type for employed workers should constitute an important part of the schools operated in urban areas for the training of technicians.

(10) Organised pre-employment curricula should be made available in evening or other part-time schools for qualified employed persons who wish to prepare for occupations of the technician type.

(11) Combinations of vocational-technical programmes with others, such as skilled trades or engineering training, under the same roof or on the same campus appear to have both assets and liabilities, when considering the effectiveness of the vocational-technical programme.

(12) It appears that no one type of institution can successfully meet all of the needs of all forms of vocational-technical education in all areas of the country.

(13) The situation appears to warrant the continuation of high quality private institutions, both non-profit-making and proprietary, in the vocational-technical field.

(14) Correspondence instruction appears to have an important place in the field of vocational-technical training.

(15) In the development of vocational-technical training programmes, there are certain underlying principles which should be taken into consideration. Among these are :

(a) Programmes for given areas, State, district, or local, should be developed in accordance with the needs of the given area for both pre-employment and supplementary training.

(b) In planning and establishing vocational-technical training programmes, the co-operation of both management and labour should be secured.

(c) Programmes should be developed through co-operative effort of all educational leadership concerned; undesirable duplication of services between institutions and agencies should be avoided.

(d) State and local programmes should be developed and maintained in those institutions which are in the best position to render the most effective service, taking into consideration the present facilities and the educational leadership of the area.

(16) The local planning of vocational-technical programmes, including representation of management and labour, appears to be the most desirable approach.

(17) As the employer of the product of vocational-technical training institutions, industry has an important role in this field. Industry should share the responsibility for providing the narrowly specialised training needed by its workers and applicable only to its business. Industry should actively co-operate with vocational-technical training institutions in helping them to organise their programmes on a sound basis, and to maintain them in keeping with changing industrial conditions.

(18) The use of advisory committees is essential to careful programme planning.

(19) Pre-employment vocational-technical training should be aimed at groups of closely knit occupations rather than at narrow specialisations or at broad general fields.

(20) Curriculum patterns differ greatly in various vocational-technical institutions, in accordance with local needs and conditions, and care may well be exercised in "lifting" curricula from other schools for use in new situations.

(21) Certain content is found which is common to many different occupations of vocational-technical type, such as supervisory skills, basic technical mathematics, and basic applications of physical science. This should be taken into account in the planning of curricula.

(22) The pre-employment curriculum for vocational-technical training should have well-planned proportions of vocational-technical content and essential content of general education character. Present practices indicate the desirability of fairly high proportions of vocational-technical content.

(23) Young persons graduated from vocational-technical programmes who are capable of doing advanced work should not be unduly handicapped when seeking admission to institutions of higher education.

(24) Admission standards for vocational-technical schools should ensure adequate preparation necessary for successful work, but should have as much flexibility as is practicable.

(25) For schools of the technical institute type, no widely accepted credential has been devised. This appears to be a problem of considerable importance for these schools, and one which merits attention.

(26) Educational leadership is greatly needed in the field of vocational-technical training.

(27) Teachers of vocational-technical subjects should be required to have adequate basic scientific and technical training, extensive industrial experience, a reasonable amount of appropriate teacher training, and personality traits which meet the needs of teaching situations.

(28) Effective programmes of vocational-technical training require plant and equipment suited to technical training and in keeping with current industrial practice.

(29) In the various war training programmes numerous new methods and techniques have been developed which improve the efficiency of teaching. It is recommended that vocational-technical schools become familiar with these methods and techniques, and utilise, with necessary adaptations, those which have proved their worth.

(30) There appears to be need for the development of instructional material particularly suited to vocational-technical training.

(31) Effective guidance service with respect to vocational-technical training is needed in the feeder schools from which students enter this field of education.

(32) In locations where the support of industry is conducive to such a programme, the co-operative plan of half-time school alternating with half-time employment, in work to which the school programme is related, is recommended for serious consideration.

(33) Women appear to be finding an increasingly important place in certain occupations of vocational-technical character. Some war production occupations now open to women may be less so after the war.

(34) In States where the programmes of vocational-technical training is sufficiently large to warrant it, special State supervision of this work is recommended.

(35) Training of vocational-technical type appears to warrant a relatively important place in post-war retraining programmes of vocational education.

(36) Studies of vocational-technical training needs in such fields as business, agriculture, home economics, public service occupations and certain semi-professions, similar to the present study in the industrial field, should be made as soon as practicable.

Training of Supervisors and Foremen

Training is provided for foremen and other supervisory workers in trade and industry to assist them in special phases of their work, covering such subjects as handling the training of workers under them ; job organisation, simplification and improvement ; human behaviour ; the development of skill and judgment ; safety ; and labour legislation. Such training is given in part-time or evening classes and either through the usual classroom organisation or through group conferences.

The training of conference leaders for industrial organisation is an important part of the programme. After training, these

persons are expected to operate in their own establishments, extending training to other supervisory personnel and helping in the analysis of training problems and needs. In one State, the first 8 or 10 hours of a series of conferences for leaders are given over to discussion of organisation of a series of foremen conferences, selection and use of conference tools and materials, preparation of auxiliary conference material, and practice in leading conferences.

Lack of qualified training personnel has limited the expansion of foreman training under the Federal-State programme, though special emphasis is being placed upon it. Non-Government-reimbursed programmes of supervisory training are often preferred by private industry.

In general, the supervisory training provided under the Federal-State programme is directed towards helping existing supervisors to develop their skills. The courses are attended by supervisors with some experience. To some extent, therefore, they serve other groups than the T.W.I. courses do, which have concentrated their attention on the training of less experienced supervisors.

The basic source of information in regard to the foreman training programmes recommended by the Vocational Division of the Office of Education is a bulletin entitled *The Training of Foreman Conference Leaders* (reprinted in 1938).[1] The suggested training courses for foreman conference leaders may be outlined in an analytic chart, as shown on the page opposite.

Remuneration during Training

During training under the Federal-State vocational education programme, trainees, whether attending pre-production or pre-employment courses or undergoing supplementary or extension training, do not receive allowances or other remuneration from the Government, unless they are qualified for Federal allowances under the veterans' training programme (see below, Chapter VII, A) or under the vocational rehabilitation scheme (see Chapter VII, C), or unless they happen to be in receipt of unemployment allowance or benefit, which is paid, of course, regardless of training, except in certain special cases in which attendance at a course of training is made a condition of the continued receipt of benefit or allowance. Trainees may be on the payroll of an industrial establishment, however, during their period of attendance at a

[1] Vocational Division Bulletin No. 125.

TRAINING COURSE FOR CONFERENCE LEADERS

Preliminary Analysis

General	Information level	Appreciation level	Operation (doing) level
General objectives			
However it may be done, the training course must in some way : 1. put the learner in possession of all functioning information ; 2. give such an appreciation of various factors affecting the successful performance of the job that the trainee will understand the necessity for securing training on the doing level ; 3. provide training on the doing level.	1. To give information as to : (*a*) situations with which a conference leader must deal ; (*b*) devices that have been developed for dealing with them. 2. To give all necessary technical information which a conference leader would have occasion to use in dealing with the various situations with which he must deal as a conference leader. 3. To give such general vocational information as would be an asset to a conference leader.	1. To give an appreciation of what a conference leader must deal with as to : (*a*) situations ; (*b*) need for recognising them ; (*c*) need for operating technique ; (*d*) need for selecting devices ; (*e*) how matters develop under working conditions.	1. To bring to the necessary minimum of doing ability on the job.
Devices that can be utilised by the trainer of conference leaders in the different stages of progression in the training course			
	1. Informational lectures. 2. Assigned readings (reference material). 3. Group discussion of cases as presented by group leader, bringing out situations and devices. 4. Experiment by group members, bringing out situations. 5. Development presentation by group leader, bringing out situations and devices. 6. Conference on possible situations and possible devices. 7. Chart of situations. 8. Demonstration of situations by group leader. 9. Chart of devices. 10. Value of different devices under different working conditions.	1. Discussion of cases. 2. Discussion of " points for discussion ". 3. Experimental demonstrations by group members followed by discussion. 4. Discussion of demonstrations by group leader. 5. Observation of the work of competent leader with a group of foremen. 6. Diagram of the development of a discussion followed by analysis and criticism. 7. Distribution chart. 8. Scoring chart on the use of devices. 9. Handling of assigned topics to be planned out and discussed in the group. 10. Analysis of situations. 11. Analysis of causes of situation. 12. Analysis of evidence as to existence of situations.	1. Demonstration by group members with group. 2. Direct work with foremen under supervision. 3. Unsupervised work with follow-up. 4. Conference following experience on the job (pooling experiences). 5. Acting as an assistant to a competent conference leader and conference with the leader on experiences obtained and situations dealt with.

training school or class ; this is more common, in present circumstances, in respect of trainees undertaking supplementary training of one of the kinds indicated above.[1]

Tuition is free of charge in the public vocational schools and technical institutes and there is no attendance fee. In some cases, however, a small charge may be made to cover certain expenses connected with the provision of a particular unit or course of training ; in all cases, this charge is small.

Training of Vocational Instructors

The training of an adequate supply of competent vocational instructors is regarded as an essential part of the Federal-State training programme. Each State plan must include satisfactory provision for the instructor training programme if the State—as all States do—wishes to use Federal funds for this purpose. Each State programme for training vocational instructors should, according to the standards set by the Federal Office of Education, include precise arrangements for—

(*a*) providing facilities for the recruitment, selection and pre-employment training of vocational instructors ;

(*b*) developing instructional aids for instructors engaged in vocational teaching ;

(*c*) providing upgrading opportunities and refresher courses for vocational instructors ;

(*d*) following up resident vocational instructors' courses in order to evaluate their effectiveness ;

(*e*) improving professional and technical college teaching so that, as appropriate, it may contribute to the education and training of vocational instructors ;

(*f*) conducting research and studies helpful in developing the vocational education programme.

The Federal legislation provides that the training of vocational instructors shall be carried out under the supervision of the State Boards for Vocational Education. It is considered that instructor training is a State rather than a local matter. The State Board is responsible for designating and approving agencies within the State to train instructors, and also for supervising the training given in this field.

Before approving any agency to train vocational instructors, the State Board ascertains that the agency has the necessary facilities and personnel ; that qualified persons will enrol for the

[1] See p. 42.

training offered ; that the proposed plan provides adequate training for instructors ; and that the number of instructors trained under the plan meets the probable needs of the State or the area of the State being served.

Each State plan specifies minimum qualifications for the different positions available for trainers of vocational instructors. The checking of qualifications against these standards is, as a rule, the joint responsibility of a representative of the State Board and of the instructor training institution. Trade and industrial education instructors must usually have had at least five years of employment in the trade in which they are to teach. In several States they are required to pass trade performance tests. The equivalent of a high school education is essential. The instructors are generally required to complete a specified minimum number of teacher-training courses within a year after employment as an instructor and to take additional professional instructor training every two or three years in order to maintain State certification as a qualified instructor. As a rule, instructors in private endorsed vocational schools and training schools of industrial companies are required to possess the same qualifications, but State certification is not required.

Federal funds may be used to maintain State and local directors of instructor training responsible for directing and co-ordinating instructor training programmes in their respective areas. Supervising instructors are employed to control the teaching experience of student vocational instructors. " Apprentice " instructors are also used in some cases ; they are usually persons further advanced than " students " in vocational experience and technical training, and sufficiently advanced to be certified as vocational instructors for an " apprentice " period in order to secure the needed teaching experience.

In trade and industrial education, instructional training is carried on as required to meet the needs of the vocational training programme in this field. It is noted that the problems involved in the recruitment and training of teachers of trade and industrial subjects differ from those of instructors of other subjects. Since trade and industrial instructors enter the teaching profession with years of occupational experience in the field in which they are employed to teach, they are occupationally trained in their own trade, many of them through apprenticeship and then further trade or technical training. In such circumstances, instructor training under the vocational educational programme is limited almost entirely to training the new instructors in the efficient

use of educational procedure and devices. As a rule, trade and industrial instructors must be given training while still employed at their industrial occupations. Recruitment often takes place after the need for an instructor for a special subject has arisen.

In many of the State programmes for vocational instructor training, formal group instruction is given to vocational teachers or prospective teachers through college or university facilities or in classes in communities accessible to a number of vocational teachers, while less formal training is given in the local schools through supervision of instructors as they work and teach, and through local State and interstate training conferences.

The Federal Government recommends pre-service training for persons with the necessary trade and industrial experience who are preparing to be vocational instructors, and in-service training for instructors and supervisors to improve their teaching efficiency and their professional skill.

Preparatory training for vocational instructors was somewhat neglected during the war and, at the same time, many new instructors lacked the standard of preparation required before the war. The summaries of annual reports of the State Boards for Vocational Education to the Federal Office of Education (Vocational Division) for the fiscal years 1945 and 1946 include a number of examples of State instructor training activities, designed, among other things, to meet this situation and also to improve the general standards for the training of vocational instructors. The majority of the States favour a short period of intensive pre-service training for vocational instructors, although less than half make provision for such training in their current programmes. One method by which the States are improving instructional training is the making of up-to-date analyses of the job of vocational instructor in different positions and localities. Some States have revised their courses of instructor training on the basis of such analyses and of conferences of State and local supervisors of vocational education held to discuss the job analyses and proposed reorganisation of instructor training.

In-service training for instructors is given in almost all the States through formal and informal instruction. Wherever the formal and informal methods for this purpose have been compared, the weight of advantage has been found to lie emphatically in favour of informal individual assistance to instructors on the teaching job, whether the help itself is given by the State or local supervisor or by the instructor trainer. In some special cases,

it has been found desirable for formal instruction to include subject-matter courses organised for certain vocational instructors, such as courses in a specialised technical field of the occupation, *e.g.*, metallurgy and electronics.

Several States are offering professional improvement courses to meet the needs of individual vocational teachers. In one State, the programme of each instructor taking a professional improvement course is approved by the local supervisor and the State instructor trainer. Vocational instructors are often given special leave and facilities for the purpose of taking a professional improvement or refresher course to complete and modernise their trade knowledge.

One State has a 72-hour apprenticeship instructor training course, required for the certification of all instructors to whom organised preparatory courses have not previously been available. The course includes 36 hours of practice instruction in one field, and in a position comparable to that in which the apprentice instructor will serve afterwards (but not "on the job" where he will serve). During the training, the apprentice instructor must make a job analysis of the occupation in which he is going to instruct. He must also make an outline of the course and set up a progress chart for use in the shop.

Another State has a 60-hour in-service training course of a functional nature, including methods of using blackboard and chalk drawings ; pictorial drawings ; how to write, use and store individual instruction sheets, etc.

In one State, all members of the State trade and supervisory training staff are responsible for carrying on : (1) systematic in-service instructor training programmes ; (2) district or area "clinics" and instructors' meetings ; and (3) organised group or individual activities to develop better instructional materials. It is noted that an incidental effect of this instructor training work has been to improve the understanding and the quality of the work of the staff responsible for supervising training.

In planning and conducting instructor training activities, the Federal Division of Vocational Education urges the States to take into consideration the following principles :

(1) In order to receive Federal funds for the training of vocational instructors, supervisors or directors, the instructor training shall be conducted under the supervision of the State Board for Vocational Education.

(2) Instructor training shall be given only to persons who have adequate vocational experience in the work for which they are preparing or who are acquiring such experience.

(3) Professional training should be provided for persons who have entered upon or are preparing to enter the positions of—

(*a*) teachers and co-ordinators of trade and industrial subjects ;
(*b*) supervisors and teacher trainers of local and State trade and industrial education programmes ;
(*c*) administrators of local and State school systems who need information concerning the purposes and methods of trade and industrial education ;
(*d*) conference leaders and job instructors for industrial plants or other organisations employing persons engaged in trade and industrial pursuits.

The Federal Office of Education suggests the following criteria as a " check list " in determining whether a State vocational instructor training programme is well organised :

(1) The training of instructors should be closely co-ordinated with the requirements of the State for certifying vocational instructors.

(2) There should be a specific allocation of responsibilities for teacher training on a Statewide basis in such manner that the instructor training should be co-ordinated with the needs of local vocational education programmes.

(3) Both local and State supervision of vocational training should be a part of the general State programme of vocational instructor training.

(4) There should be a special programme for pre-service training of prospective vocational teachers for both full-time and part-time employment.

(5) A specific provision should be made for the following up of new vocational instructors in the State by the agency or agencies responsible for their initial training.

(6) Specific provision should be made for the in-service training of vocational instructors employed either on a full-time or on a part-time basis ; this programme should be a part of or co-ordinated with local plans for improved vocational instruction through supervision.

(7) Both the pre-service and in-service training programmes and courses for vocational instructors employed on a part-time basis should be differentiated from the programmes and courses organised for teachers employed full-time. The form should be " streamlined " to meet the specific needs of part-time instructors in their own fields of work.

(8) Definite provision should be made for pre-service and in-service training for co-ordinators and supervisors of trade and industrial education.

(9) Administrative staff of vocational schools should be trained in regard to the purposes and general methods of planning and conducting trade and industrial training.

(10) Provision should be made for granting certification credit based upon the successful completion of work required in professional courses, research projects and workshops.

Research

It is considered that well-planned research activities lie at the core of a sound programme of vocational education. One of the main functions of the Federal Division of Vocational Education is to conduct the research necessary for expanding and improving the programmes of training conducted under the Federal vocational education legislation. The research activities of the Division are carried out very largely by the staff attached to its various services. The Trade and Industrial Education Service has undertaken the following research activities, among others, during the last two years: study of the availability of related instructional materials for 391 apprenticeable occupations; development of a uniform programme of apprentice instruction for six shop crafts for the railroad industry; development of procedure and curriculum for the training of practical nurses [1]; development of a safety instructor training programme for the Rural Electrification Administration; study of training requirements of non-professional hospital employees; study of vocational education in the years ahead.

Within the States, systematic provision for research and experiment forms a part of the State plan and is generally linked with the State programme of instructor training in trade and industrial education. The purpose of the research is to outline the training needs of the State and to contribute to the improvement or expansion of trade or industrial education in that State and whenever possible in other States.

Research on vocational training may be conducted by institutions or agencies designated for instructor training by the State Boards for Vocational Education or it may be conducted by the State Board itself.

The following types of research illustrate those which are now being carried on in the States and in respect of which Federal funds provided for instructor training may be used:

(1) Identifying and determining industrial training needs, both in the various industries and occupations and of the various categories of workers.

(2) Methods of instruction.

(3) Supervision of training.

(4) Training facilities and materials.

(5) Industrial employment and occupations.

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[1] Nurses not fully trained professionally but employable for ordinary service.

(6) Placement and follow-up of trainees.
(7) Standards for the organisation and administration of training programmes.
(8) Evaluation of the effectiveness of vocational instruction.
(9) Selection and training of vocational instructors.
(10) Methods of co-ordinating training with industrial requirements.

Research activities relating to trade and industrial training have been expanded in most States since the war. Particular attention has been given to problems of employment opportunities and training needs in the post-war period. Among the subjects analysed have been a survey report on vocational school requirements; vocational school graduates' placement study; report on survey of training programmes and training facilities at a large shipbuilding and drydock company; analysis of the occupation of practical nurse; study of the need for area trade schools; employment opportunities in the construction technical field; mechanical adaptability test; Statewide industrial survey; occupational guide outline for use in on-the-job training of veterans, etc.

Conclusions

(Prepared for the International Labour Office by the Chief of the Trade and Industrial Education Service of the Vocational Division, U.S. Office of Education.)

Thirty years of experience in the development and operation of an adult vocational education programme for workers in trade and industrial pursuits has developed some lessons for education. Rather than leave the business to be performed haphazard on the highways and byways by the trial-and-error method, experience has shown that adult workers at practically all ages desire and will utilise organised training in small doses. Such training must be specific, functional, efficient, readily available, and conserve the limited time of the individuals desiring it.

As indicated in the preceding pages, there are two principal types of vocational training provided for adults under the Federal-State vocational education programme. First, extension or supplementary training for the further development of their performance skills and of occupational knowledge in the industrial pursuit in which they are employed. This type of training is usually offered in short unit evening courses, attended voluntarily by workers employed in the occupation for which the training is organised and, as a rule, taught by instructors selected from the trade.

Experience has indicated that the effectiveness of the instruction provided through these courses is dependent partly upon developing the content of the courses after careful analysis of the trade or occupation concerned and making them functional in terms of the work of those enrolled in them, and partly upon the proper selection of trade-competent instructors thoroughly familiar with the occupation, and the use of specific units of instruction accompanied by pre-service and in-service intensive teacher training in utilising special adult educational procedures, methods and devices.

The second type of programme for adult industrial workers provides preparatory training for entrance into an occupation other than the occupation in which the trainee has had experience. This is a job-changing type of instruction, and after the change in employment is effected, may be followed by trade extension training as indicated above. Trade preparatory training usually requires full-time school attendance and is given to equip learners with the basic skills, specific technical knowledge and related industrial information necessary to secure and hold a job. Since the objective is to enable those enrolled to enter industry and meet definitely explicit job requirements, emphasis is given to training in skills as practised locally, and it requires more school attendance time on the part of trainees than do trade extension courses.

The following factors have been found to be basic to the effective operation of trade preparatory courses :

(1) The group securing the instruction must be homogeneous and selected to be able to profit by the instruction, and to use it satisfactorily in employment upon completion.

(2) The subject-matter to be taught must be such as directly functions in the work for which the pupil is being vocationally trained. The teaching of non-functioning skills, non-functioning knowledge or non-functioning abilities must be carefully eliminated from the operation of the courses. Since the course is to equip for a specific occupational level, a comparison of the content taught with the obtainable objective is made, and content, although functioning in the occupation, if it functions at a level above the objective, is excluded from the units of instruction. The trainees can acquire much advanced training in future trade extension courses after they enter employment.

(3) The instructors must have been occupationally trained in the trade or occupation that they are employed to teach. It is important that the instructors are either employed in the occupation

or can easily be employed in it. Usually instructors are selected from among outstanding craftsmen in the industry, with from five to seven or more years of trade experience and with a demonstrated ability to teach. They receive special teacher training in the use of adult teaching procedures and methods after selection and, usually, after employment as instructors.

(4) The trainee while being trained should be placed in an occupational atmosphere and environment. Working conditions should parallel those of the industry for which the persons are being trained. A shop rather than a school environment is essential, equipment, processes, discipline, personnel relations, pressure of speed, standards for accuracy and jobs performed should parallel as nearly as possible those of the industry for which the selected group are being specifically trained.

(5) The instruction and training should be based upon prevailing occupational standards. The objective is to assist the individual to get a job and hold a job. Unless this is accomplished effectively, the whole trade preparatory programme has failed. Under-training, over-training and non-functional training must be eliminated. The character of the shop products, shop standards, types of training jobs, technical content and occupational equipment of the instructor must correspond to those of the occupations by direct recent comparison.

(6) Provision should be made for individual instruction necessary for the progress of any member of the group, and each member should be permitted to progress as rapidly as his ability will permit. Special attention should be given to slow learners, and all learners advanced as rapidly as they satisfactorily complete performance tests organised for each level of operation. Individual student progress records should be maintained. Organised individual student assignment sheets should be prepared, issued and checked. The course should be blocked out from a careful analysis of the occupation and its content selected to fit the level of employment desired. Students should be allowed to enter training at any time they are available and to progress individually, and should be placed in employment as soon as suitably trained and be able to hold a job satisfactorily. School terms, graded courses and formal organisation, such as usually prevail in the full-time school, should be disregarded.

(7) To be effective, the training must be on the real jobs and production paralleling the industry for which the training is organ-

ised. Any introduction of an artificial situation, pseudo-jobs and exercises will tend to develop habits which subsequently may prove to be a handicap to the trainee when he actually goes to work. Building trades workers will be trained on actual building construction ; metal workers on production of usable metal products ; food workers on quantity food production ; garment workers on regular usable garments by industrial methods, etc.

(8) All subject-matter and training should be arranged in the most effective instructional order of difficulty, and repetitive training in the various operations should be given to assure that each operation is mastered at an employable standard. The instruction at each operation level should be maintained until the trainee has passed the appreciation and information stage and has progressed to a repetitive operating stage at a rate comparable to prevailing industrial standards and with correct procedure, speed and accuracy. However, when appropriate tests have indicated that this has been attained, the student should be advanced to the next operation. The pressure for production should not allow the student to be retained on one job after mastery and beyond the learning period, since otherwise exploitation will take place.

(9) Efficient use must be made of special adult education methods and devices with regard to the characteristics of the group to be instructed, the working conditions and the specific nature of the content of vocational instruction. Pre-employment adult instructors will require organised training and information in the technique and use of special methods of instruction. They will require continuous supervision on the job for the purpose of improving this instruction.

CHAPTER III

APPRENTICE TRAINING [1]

The system of apprenticeship in the United States is designed primarily for young persons between the ages of 16 and 24 years, although older persons (in particular, employed workers and ex-service personnel) may be admitted to apprenticeship. The system has as its aim efficient training for all-round skills, while at the same time maintaining desirable standards of employment. The United States programme is unique in its approach in that it depends entirely on securing the voluntary co-operative action of management and labour to attain the objectives desired. The standards established under Federal or State apprenticeship legislation express desirable minimum standards, but adherence to them is not required.

The United States apprenticeship scheme took shape as a national programme in 1937, when Congress, in adopting the Fitzgerald Act, formally recognised the national interest in the systematic training of all-round skilled workers. Before this initiative was taken, only two States had apprenticeship agencies, and only a few crafts, industries and undertakings had a co-ordinated and well-established system of apprentice training. Ten years later, in 1947, 29 States and Territories and the District of Columbia had apprenticeship programmes for training skilled workers in conformity with policies recommended by the Bureau of Apprenticeship. The rapid progress which has been made in the organisation of apprenticeship is attributed very largely to the national legislation and the action taken thereunder by the Federal apprenticeship authorities. It is reflected in the recent figures of apprenticeship programmes and individual apprentices registered with the Federal Apprentice Training Service:

Registered programmes:	March 1947	March 1948
Area-wide group programmes	3,346	4,659
Individual plant programmes	17,035	32,675
Total	20,381	37,334

[1] This monograph includes a consideration of apprentice training even though apprenticeship is primarily for young workers, because apprenticeship is also to some extent a method of training adult workers and because it is of basic importance in the over-all training programme of the country.

	March 1947	March 1948
Establishments participating :		
Construction industry	48,924	64,500 [1]
Other industries	38,605	56,700 [1]
Total	87,529	121,200 [1]
Registered apprentices	127,088	207,863

[1] Estimated figure.

Legislative Basis

The Fitzgerald Act of 1937 (Public No. 308, 75th Congress) is the basic Federal Act governing the organisation of apprenticeship in the United States. In addition, 22 States and Territories and the District of Columbia have apprenticeship legislation.

The Federal Act authorised the Secretary of Labor to formulate and promote the furtherance of labour standards necessary to safeguard the welfare of apprentices, to extend the application of such standards by encouraging their inclusion in contracts of apprenticeship, to bring together employers and labour for the formulation of programmes of apprenticeship and to co-operate with State agencies engaged in formulating and promoting desirable apprenticeship standards.

The Act is administered on the assumption that the Government's role is restricted to the stimulation of voluntary action on the part of management and labour, and that the primary responsibility for organisation and carrying out the training lies with the employers and workers concerned.

Federal Financial Aid

No Federal financial aid is given to industry or to the States under the Fitzgerald Act. The Bureau of Apprenticeship maintains a staff of technical consultants in various sections of the country, who help industry to organise programmes of apprenticeship and provide continuing technical assistance after the programmes are put into operation.

Experience has proved that the productive work performed by apprentices is such that the apprentices pay their own way, and that the cumulative effect of having well-trained craftsmen justifies not only the wages paid to apprentices during training but also any administrative cost involved in supervising their on-the-job training. Trade unions, too, consider that the value of apprentice training to them justifies the expenditure of union

funds for supervising the apprenticeship programme or for sharing the expenses of the employer in such supervision.

The national apprenticeship programme has grown to such proportions that Federal and State authorities are finding it impossible to give all the services demanded by industry because of lack of sufficient staff.

Federal Apprenticeship Standards

To carry out the Fitzgerald Act, the Bureau of Apprenticeship was set up by the Secretary of Labor as an agency of the Department of Labor.[1]

In order to help in developing apprenticeship standards and policies, a committee was also appointed, made up of representatives of management, labour and interested Government agencies and known as the Federal Committee on Apprenticeship.

Briefly, the basic principle of the Bureau of Apprenticeship is that schemes for apprentice training should be mutually satisfactory to both employers and workers. Recognising that apprentices are employed in a large variety of trades and that conditions vary, the Federal Committee has recommended standards which are general in scope and which are intended to represent the essential provisions that an apprenticeship programme should include. Employers and workers in each trade are responsible for working out and applying their own detailed standards and policies in the light of the requirements of their particular trade.

The following are the standards formulated to guide the staff of the Bureau of Apprenticeship in assisting industrial establishments to set up systems of apprenticeship :

(1) An apprenticeable occupation is defined as an occupation which requires 4,000 or more hours to learn.

(2) A schedule of the work processes to be learned on the job must be drawn up.

(3) A progressively increasing scale of wages for the apprentice, which should average approximately 50 per cent. of the journeymen's rate over the period of apprenticeship, should be established.

(4) Provision should be made for related classroom instruction (144 hours per year of such instruction is normally considered necessary).

[1] The Bureau (called the Apprentice-Training Service until the name was changed in February 1948) was transferred in 1942, first to the Federal Security Agency and then to the War Manpower Commission; it was returned to the Department of Labor on 19 September 1945 by Executive Order No. 9617.

(5) The terms and conditions of the employment and training of each apprentice should be stated in a written agreement and registered with the State Apprenticeship Council.

(6) A review of local apprenticeship should be undertaken by a State Apprenticeship Council.

(7) The apprenticeship scheme should be jointly established by the employer and the employees.

(8) Adequate supervision and the keeping of records should be required for all apprenticeship programmes.

An apprentice is defined as a person of at least 16 years of age who is covered by a written agreement registered with a State Apprenticeship Council (or where no such council exists, with the Federal Committee on Apprenticeship) and providing for not less than 4,000 hours of reasonably continuous employment and for his participation in an approved schedule of work experience through employment, which should be supplemented by 144 hours per year of related classroom instruction.

The practices customary in the particular industry and the following criteria are used in determining whether or not an occupation requires apprenticeship training :

In general, an apprenticeable occupation is one which—

(1) customarily has been learned in a practical way through training on the job ;

(2) is clearly identified and commonly recognised throughout the industry ;

(3) requires 4,000 or more hours of work experience to learn ;

(4) requires related instruction to supplement the work experience (144 hours of such instruction during each year of the apprenticeship is usually considered the minimum) ;

(5) is not merely part of an occupation already recognised as apprenticeable by the Federal Committee on Apprenticeship ;

(6) involves the development of skill sufficiently broad to be applicable in like occupations throughout an industry, rather than of restricted application to the products of one company ;

(7) does not fall in any of the following categories :

(a) selling, retailing or similar occupations in the distributive field ;
(b) managerial occupations ;
(c) clerical occupations ;
(d) professional or semi-professional occupations (this designation covers occupations for which entrance requirements customarily include education of college level) ;
(e) agricultural occupations (this designation includes those engaged in the growing of crops, fruits, nuts, etc., and the raising of livestock, poultry, etc.).

A list of occupations now regarded as " apprenticeable " is given in the annex at the end of this chapter.

The basic minimum standards of apprenticeship are applied by means of inclusion in national joint trade apprenticeship standards, or by adoption by the States or by bringing together employers and employees in programmes of apprenticeship which conform to the standards.

National minimum trade standards have been developed by joint apprenticeship committees representative of national employers' associations and labour organisations for the following trades : bricklaying, plumbing, steamfitting, electrical, carpentry, painting and decorating, plastering, stained glass, roofing, tile setting, sheet metal, cement finishing, terrazzo and mosaic, and photo-engraving.

Administrative Organisation of the Apprenticeship Programme

Federal Administration

The Federal Committee on Apprenticeship.

The Federal Committee on Apprenticeship, which is the joint labour-management policy-making body for the Bureau of Apprenticeship, has been called the keystone of the United States apprenticeship scheme. It has brought together various trade and sectional interests into one apprenticeship programme and has set a pattern for labour-management committees throughout the country. The Committee, appointed by the Secretary of Labor, is composed of four representatives of management, four of labour and a representative of the United States Office of Education.

The general functions of the Committee are—

(1) to promote a better understanding of labour standards necessary to safeguard the welfare of apprentices by securing the active co-operation and support of management-labour groups ; and

(2) to formulate broad policies on various phases of the apprenticeship programme for the Bureau of Apprenticeship.

The Bureau of Apprenticeship registers, in the name of the Committee, programmes and agreements which meet the standards of the Federal Committee on Apprenticeship where there is no State apprenticeship agency to perform this task. The Committee advises on matters relating to State apprenticeship legislation. It advises and acts on policy affecting the employment of apprentices in different conditions. Its advice may be asked on the extent to which a particular scheme should be modified to take

account of technological changes and recruitment problems in the different trades.

The Committee was called upon to formulate policy adapting the apprenticeship programme to wartime needs ; it worked out, for example, the basic standards for the upgrading programme of on-the-job training for semi-skilled workers which was known as the " advancing worker " programme.[1] Since the war, the Committee has examined a number of problems arising in the readjustment of the apprenticeship programme to post-war requirements and, in particular, to the needs of ex-service personnel. It has taken a part in the efforts to expand the programme to a scale corresponding more nearly to the vast demands of industry for all-round skilled workers.

The Bureau of Apprenticeship.

The Bureau of Apprenticeship is responsible for carrying out the provisions of the Fitzgerald Act and the policies and standards formulated thereunder and acts as a clearing-house for the operation of the national apprenticeship programme in the different areas and trades. The functions of the Bureau are, in general :

(1) in co-operation with national advisory committees, to develop and formulate standards of apprenticeship for the training of skilled workers by industry ;

(2) to extend the application of these standards by bringing management and labour in the different industries and trades together to work out apprenticeship programmes in accordance with recommended standards ;

(3) to provide services for the review of apprenticeship programmes for conformity with accepted standards and for the registration of apprentices and programmes ;

(4) to give technical and advisory service in the development of programmes and their maintenance and operation ;

(5) to conduct research in matters affecting apprenticeship and to compile necessary statistics and factual data on the subject ;

(6) to disseminate information for bringing about better understanding and arousing public interest in the training of skilled workers through apprenticeship ;

(7) to protect apprenticeship interests and apprenticeship welfare under other Federal legislation or regulations (*e.g.*, the Fair Labor Standards Act, the Public Contracts Act).

The Bureau also has the following fields of activity :

(1) assistance in improving or introducing apprenticeship programmes ; for this purpose, it gives advice on the principles and methods

[1] See above, p. 15.

of organising and operating these programmes and of adapting them to particular conditions or to the needs of particular groups of workers ;

(2) advice on questions of labour relations arising out of apprenticeship ;

(3) interpretation of the Federal standards of apprenticeship ;

(4) following of apprenticeship developments in other countries and also, on request, provision of information to foreign countries on apprenticeship policy and procedure in the United States.

The Bureau of Apprenticeship has its headquarters in the Federal Department of Labor in Washington, D.C. It is headed by a Director, who is assisted by six Assistant Directors and technical, research and clerical personnel. The Bureau has 12 regional offices, each under the direction of a trained regional supervisor, who works under the supervision of the Director.

Field representatives of the Bureau of Apprenticeship. The Bureau has approximately 270 full-time field representatives, placed in various industrial localities. As a basis for their operations, there are 200 field offices subordinate to the regional offices, and the aim is to establish a field office in every vital industrial area.

The field representatives are selected from a register of persons qualified through a civil service examination in which great stress is placed on experience of formal apprenticeship work, whether from the labour-management or from the public agency side. They work in co-operation with the State apprenticeship agencies where such agencies exist, and are available upon request to assist managements, trade unions or public agencies in setting up apprenticeship programmes and in dealing with the problems which may arise in their operation.

The Bureau of Apprenticeship has found that the maintenance of this corps of trained field representatives is of inestimable value in encouraging the setting up of new apprenticeship schemes, planned and carried out in conformity with the standards approved under the national programme, and in maintaining the quality of these schemes once they have been set up. The Bureau has also found that there is little advantage in setting up an apprenticeship scheme unless a continuing maintenance service is provided.

State Apprenticeship Agencies and Machinery

In order to develop Federal-State co-operation in apprenticeship training, and also to enlist the co-operation of State associations of employers and workers, the State Departments of Labor are encouraged and assisted to establish apprenticeship agencies.

In June 1948, 26 States had such agencies, as well as the Territories of Alaska, Hawaii and Puerto Rico and the Federal District of Columbia. In 20 of these States, the District of Columbia, Hawaii and Puerto Rico the agencies were set up as a result of specific State (or Territory) apprenticeship legislation. The remaining six State agencies and that for Alaska were set up under the general organic Acts of the State or Territory.

The State Apprenticeship Councils are made up of an equal number of representatives of employers and workers (as a rule, four of each), and usually include a representative *ex officio* of the State Board of Vocational Education and the State Department of Labor. Many of the State agencies include a representative of the public as a regular member. The standards followed by these agencies, whether included in the State law or laid down by the agency, generally conform closely to those recommended by the Federal Committee on Apprenticeship. After a State agency has been appointed (by the Governor or by the Labor Commissioner) and has prepared these standards or procedures, it becomes a part of the national apprenticeship system by securing recognition from the Bureau of Apprenticeship on behalf of the Federal Committee on Apprenticeship. Uniformity among State programmes is encouraged so that workers from one State, on concluding their apprenticeship training, may qualify for employment in other States, and so that there will be co-ordination of apprentice training throughout the country.

In general, the State apprenticeship agencies determine policies and standards, while the administrative unit puts the policies and standards into practice. In other words, at the State level the relationship between a State Apprenticeship Council and an Apprenticeship Division or other administrative agency of the State is substantially the same as that between the Federal Committee and the Bureau of Apprenticeship at the national level. In 11 States, two Territories and the District of Columbia, there is a full-time director of apprentice training.

The functions of the State administrative agencies of apprenticeship vary from one State to another but have a number of features in common. As described in a recent pamphlet [1], the

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[1] *Apprenticeship Practice in the United States*, by E. Danaher (Stanford University, California, Graduate School of Business, Business Research Series, No. 3, 1945). This pamphlet is a useful practical description of how the apprenticeship programme operates, and its contents have been drawn upon in the preparation of the present chapter. Another good general source of information is *Educating for Industry*, by W. F. Patterson and M. H. Hedges (New York, Prentice-Hall, Inc., 1946).

functions of a typical State administrative unit might be along the following lines, though all of these functions might not be performed in each State :

(1) to assist in establishing new joint trade apprenticeship committees ;

(2) to advise local joint trade apprenticeship committees on apprenticeship problems ;

(3) to assist in enlisting the services of technical consultants on apprenticeship ;

(4) to promote the development of standards of apprenticeship by urging that these standards be included in individual apprentice indentures ;

(5) to review new indentures submitted to it for approval either directly from the employer in the absence of a local joint trade apprenticeship committee or through the latter body if one is in operation (such a review often results in suggestions for changes in the instrument to make it acceptable and in investigations to determine if the indenture is within the law in all particulars) ;

(6) to issue a formal, written official acceptance of apprenticeship agreements found satisfactory ;

(7) to maintain a register of apprentices under approved agreements, a file of all approved apprenticeship agreements, a record of all joint trade apprenticeship committees in existence, and a list of all private plants operating under approved apprenticeship standards ;

(8) to issue in the name of the State Apprenticeship Council a formal, written official certificate of completion of apprenticeship (certificate of journeymanship) to those workers satisfying all the requirements expressed in the apprenticeship indenture ;

(9) to inform employers and workers concerned of the failure to meet the requirements of apprenticeship as set forth in the indenture, and to warn these parties that continued failure to rectify these shortcomings will result in withholding the certificate of completion of apprenticeship ;

(10) to conduct fair and impartial investigations and hearings in cases of requests for cancellation of indentures. The facts surrounding the cancellation are to be ascertained, and reconciliation of the parties to the indenture may be attempted if this is feasible ;

(11) to issue a formal, written official cancellation of the apprenticeship indenture if both parties wish the indenture cancelled and facts warrant this action ;

(12) to accept complaints of violation of apprentice agreements, to hear and investigate these charges, to determine points of fact, and to render a judgment subject to review in the courts on questions of law ;

(13) to investigate requests to transfer an apprentice from one employer to another, ascertaining whether such a transfer will be helpful to the apprentice and the employer ;

(14) to recommend to the Administrator of the Fair Labor Standards Act that an apprentice be employed for less than the prescribed minimum wage if all conditions are satisfactory, and to

refuse to recommend such action in cases where an employer fails to afford his apprentices satisfactory training conditions ;

(15) to make annual or biennial reports to the State Legislature and to the public of its activities and findings (pending legislation may be discussed and recommendations for changes in the existing laws suggested) ;

(16) to co-operate with other State agencies, the U.S. Department of Labor, veteran groups, and labour and management groups in furthering the acceptance of approved apprentice standards and in stimulating the growth of approved apprenticeship programmes ; and

(17) to serve as a clearing-house for information on apprenticeship.

General Committee on Apprenticeship for the Construction Industry

The General Committee on Apprenticeship for the Construction Industry, composed of representatives of contractor associations and trade union organisations in the building trades, advises the Bureau of Apprenticeship on apprenticeship problems in the industry ; encourages contractor associations and trade union organisations to agree upon and establish national standards of apprenticeship ; encourages the individual trade associations and trade unions to follow the practical application of the standards in the localities ; and advises on policy and procedures to be used by the Bureau's field staff in carrying out the functions of the agency. The General Committee has an Executive Committee which acts for it between meetings.

Joint Trade Committees on Apprenticeship

National Committees.

A number of national employers' and workers' organisations have set up joint trade apprenticeship committees on a national basis. These committees are composed of equal numbers of representatives of the employers' and workers' organisations concerned with the trade. The chief purpose of these joint trade committees is to work out, in co-operation with the Bureau of Apprenticeship, minimum and uniform apprenticeship standards for the trade, to encourage their local units to accept and apply these standards in their local programmes and to supervise, in a general way, the methods used and the results achieved.

The Bureau of Apprenticeship provides continuing technical service to the national joint committees (statistical data, copies of trade agreements, etc.), and also draws upon these committees for advice in dealing with special training problems in the industries in question. The standards formulated by these committees are advisory in character and do not have the force of law.

Local Committees.

Since the training of apprentices takes place at the local level, the whole United States apprenticeship training programme is based on the setting up, by the local employers' and workers' associations, of local joint apprenticeship committees for each trade in which apprentices are being or are to be trained.

At present, there are over 6,114 local joint trade apprenticeship committees; for example, the painting trades have 422 joint committees, the electrical trades about 400, the metal trades 300, and the construction trades, as a whole, 3,048.[1] These local trade committees are composed of an equal number of employers and journeymen appointed by their respective organisations. A chairman and secretary are usually elected by the members, and the times and places of regular meetings determined. On some committees, consultants from the State or Federal apprenticeship agencies or from the vocational schools are frequently called upon for assistance.

The local joint trade apprenticeship committees are responsible for drawing up standards to govern the training of apprentices in the trade in the community by all employers belonging to the local employers' organisation and by any other employers willing to subscribe to the apprentice training system as formulated by the committee.[2] The written apprentice training programme for the trade in the locality includes as a rule:

(a) *standards of employment*, setting out qualifications for employment, such as the amount of required education, aptitude for a skilled trade, age limits, wages and hours, etc.;

(b) *standards of training*, setting out the terms of apprenticeship, the schedule of work processes to be learned, the amount of time the apprentice will be required to attend classes in vocational schools to receive instruction in subjects related to his trade, and the standard of deportment required;

(c) *procedures for the supervision and examination of apprentices*, setting forth the way in which each apprenticeship agreement is executed and registered, the supervision of the work on the job and at school and the methods of examining the apprentice at the end of his apprenticeship.

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[1] It is estimated that to service the construction industry effectively for apprentice training, some 5,000 committees would be required. In other industries the gap between the number of committees in existence and the number needed is equally wide, and for the most part wider.

[2] In most area trade programmes, especially in the construction industry, the apprentices are apprenticed directly to the local trade committees rather than to individual employers.

The work of the local joint trade apprenticeship committees — which constitute the core of the national programme — may be illustrated briefly by listing the enumerated duties of one of the joint plumbing apprenticeship committees :

(1) to determine the need for apprentices in the locality and the shop facilities available for acquiring the necessary experience on the job ;

(2) to establish minimum standards of education and experience required of apprentices, and to pass on the qualifications of apprentice applicants ;

(3) to place apprentices under agreement (every apprentice, his parent or guardian — where the apprentice is a minor — and every employer employing an apprentice under the standards shall sign an apprenticeship agreement) ;

(4) to determine the quality and the quantity of experience on the job which the apprentice must have, and to be responsible for his obtaining it ;

(5) to hear and adjust all complaints of violation of apprenticeship agreements ;

(6) to arrange tests for determining the apprentice's progress in manipulative skills and technical knowledge ;

(7) to maintain a record of each apprentice, showing his related schooling, experience and progress in the learning of the trade ;

(8) to certify to State or local examining boards that the apprentice is sufficiently skilled to be eligible to take the journeyman plumber's examination, and upon his passing the examination to recommend to the State Council that he be awarded a certificate of journeymanship ;

(9) in case of lay-offs, strikes, or lockouts, to take such action as is necessary to protect the welfare of the apprentices (in such cases, the committee should seek the advice of the State Apprenticeship Council) ;

(10) to make an annual report covering the work of the committee to the respective employer and employee groups, and to keep the State Apprenticeship Council informed of progress ; and

(11) in general, to be responsible for the successful operation of the apprenticeship standards of the plumbing trade in the locality by performing the duties listed above ; by co-operating with public and private agencies which can be of assistance ; by obtaining publicity in order to develop the support and interest of the public in apprenticeship ; by keeping in constant touch with all parties concerned—apprentices, parents (where the apprentice is a minor), masters and journeymen.[1]

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[1] Additional duties often discharged by local joint trade apprenticeship committees are as follows :

(1) to determine whether learners engaged in the trades are properly indentured ;
(2) to extend the time of apprenticeship when the apprentice fails to complete requirements for journeymanship ;
(3) to reduce the term of apprenticeship by not more than a certain percentage of the total term when the apprentice has had satisfactory training or has demonstrated unusual proficiency ;
(4) to evaluate and grant suitable credit for varying degrees of preparation achieved by apprentices in the various trades ;
(5) to check on the working conditions of apprentices.

In the building trades, as a general rule, the local joint apprenticeship committee has a continuing and operating responsibility in carrying out the apprenticeship system in the community. In manufacturing industries, on the other hand, the local committees have continuing advisory functions rather than direct supervisory functions.

Plant Committees.

Where, for one reason or another, it is not practical for an employer to take part in a trade apprenticeship programme organised on a local basis, the employer and the union concerned are encouraged to set up a joint management-labour committee to draft an apprenticeship programme for the plant and to advise on its application. The plant programmes usually make provision for a full-time or part-time supervisor of apprenticeship and outline his functions in general and in relation to those of the plant apprenticeship committee. Where the apprenticeship programme is organised on a plant basis, it is considered important to make provision for an apprenticeship supervisor and to delineate his tasks clearly, and also to maintain an active joint apprenticeship committee ; this helps to ensure continued interest in the application of the programme in accordance with the standards of training considered desirable by the Federal and State apprenticeship agencies or by the trade itself.

Where workers in a plant have no organisation or where the existing workers' organisation is not particularly concerned with the training of skilled workers, the employer establishes his own apprenticeship system and registers it with the State Council. Since the State Council is made up of equal numbers of employers' and workers' representatives and has agreed upon basic standards for the training of apprentices, its review and registration of an employer's apprenticeship scheme is construed as meeting the basic standard of the national apprenticeship programme. However, it is usually recommended that, at the earliest possible moment, a joint committee should be set up within the plant to ensure co-operative management-labour application of the plant's apprentice training scheme.

General Procedure and Conditions of Apprenticeship

Estimation of Apprenticeship Requirements

The Bureau of Apprenticeship, through its technical fact-finding work, provides estimates, by trades and by States, of the number of apprentices in training and the stage of apprenticeship which they have reached. In addition, one of the functions of the national joint trade committees is to provide as precise estimates as possible of the number of apprentices likely to be needed in the trades concerned, and the local joint trade committees are responsible for undertaking local surveys to ensure that the local needs of their trades are defined as precisely as possible. Finally, the State apprenticeship agencies make analyses of State apprenticeship requirements for the different trades and localities.

However, precise estimates are difficult to secure and it is considered that one of the outstanding problems of the whole apprenticeship programme, at every level of operation, is that of finding more accurate means of estimating the number of apprentices needed in each industry, each trade and each locality. The Director of the Bureau of Apprenticeship, noting that the last comprehensive census of skilled workers was taken in 1940, has urged that a study should be made, in every area, community and trade, by the local joint management-labour apprenticeship committees, or, where no such committees exist, by employers' organisations or trade unions.

As a basis for determining the number of apprentices needed, the Bureau has recommended that any survey should provide information on—

(1) the number of skilled men in the trades ;

(2) the average age of the skilled workers ;

(3) the rate of loss of craftsmen in the industries ;

(4) the number of apprentices in training ;

(5) an estimate of the volume of production, building and service required over a period of years ;

(6) the number of skilled workers needed ; and

(7) the number of apprentices needed for each trade.

Since the apprentice is an employed worker, the number to be trained locally depends on employment opportunities and the ability of the industry to provide continuing employment during the apprentice period. Such a survey is considered the only accurate means of determining the number of apprentices

that can be trained, and it must cover the whole industry if sufficient numbers of apprentices to meet future needs are to be trained. Industries that neglect the training of apprentices, either wilfully or because of circumstances, are likely to encounter a shortage of competent skilled craftsmen, and this often leads to an attempted short-cut for the training of skilled craftsmen which tends to be expensive and to fall short of the objective. The apprentices to be trained are so related to the economic situation of the industry that the number can best be determined locally by those who will provide the training. Experience has shown that the number of apprentices in training will rise with increased employment opportunity. The total number will be in proportion to the number of programmes established and effectively operated by the industry.

Ratio of Apprentices to Journeymen.

Almost all trade apprenticeship schemes include some provision fixing the ratio of apprentices to journeymen. For example, in the standard set for apprenticeship in die making and die sinking, it is stipulated that there shall be one apprentice to every ten trimmer die maker journeymen or die sinker journeymen, except under conditions approved by the joint shop apprenticeship committee. This is one method of determining the number of apprentices in training, although in the past apprentices have not often been employed to the full agreed ratio. However, in cases where the trade unions feel it necessary or desirable to control the inflow of apprentices, the apprentice-journeymen ratio assumes considerable significance.[1]

In many instances the restrictive practices established by a trade group are a result of some abuse in the past when the training of apprentices was exploited to the disadvantage of the apprentice and the journeyman worker. Rigid controls on the number of apprentices to be trained have not proved to be the answer, however. The correct answer to the question how many apprentices should be trained can only be given by the apprenticeship committee possessing accurate information, an intimate knowledge of the needs of the industry, and the equipment and facilities available to do the training. In such conditions, the ratio of

[1] This is pointed out in *Apprenticeship Practice in the United States*, *op. cit.*, p. 42, in which reference is also made to an interesting study published by the Brookings Institution in 1941, entitled *Union Policies and Industrial Management*, by Sumner SLICHTER, which includes a number of discussions of apprenticeship and the questions arising out of present practices.

apprentices to journeymen can be liberalised to meet existing conditions. Without an effective means of determining the need, the number of apprentices in training often falls far short of the requirements of the industry owing to the withdrawal of skilled workers by death, retirement or other causes. Large industrial plants with a retirement programme and information on the turnover in employment are in a position to determine the number of apprentices to train.

Setting up a Plant Apprenticeship Programme

In setting up an apprenticeship programme in a plant, it is important to secure the co-operation of the supervisory and journeymen workers, who are the persons mainly responsible for the success of the programme. This can best be accomplished through a joint committee representative of the management and the trade unions concerned. Where the employees are not organised, it makes for good employee relations to ask the advice of the foremen and skilled workers on the development of the programme. This helps to bring into focus all of the knowledge and skill obtainable for the trade or trades to be included in the programme, and to secure the co-operation of the workers and foremen who will be called upon to instruct and train the apprentices. There is no special procedure for handling the different aspects of the programme, but the following are suggested by the apprenticeship authorities as a guide :

(1) The trade or trades to be covered by the scheme should be determined.

(2) The major on-the-job training processes for each trade should be listed and checked to see if adequate experience on these processes will develop an all-round skilled worker for the trade.

(3) After the major work processes are listed, their relative difficulty and importance should be determined, and the amount of time the apprentice will work on each process allocated. The estimated length of time required for training can then be determined by totalling the hours of training needed on each process.

(4) The qualifications of apprentice applicants, provision for the apprentice agreement, related instruction requirements, number of apprentices to be trained, and wages to be paid to apprentices should be decided.

(5) The method of keeping records of apprentices' work experience and supervision of the apprentices should be set down carefully, as good supervision is a vital factor in the success of the programme.

In larger plants, department instructors are used to provide the actual training of apprentices. The size of the plant (especially in terms

of the number of skilled workers and the number of apprentices) determines whether one or more men can be assigned full-time to the work of apprentice instruction. These instructors (usually one for a department) are responsible, as a rule, for instructing apprentices on the job when they are assigned a new class of work, for keeping apprentice records and seeing that the apprentice follows the prescribed work schedule. More often, specific journeymen workers are selected for their knowledge of the trade, and ability and interest in training apprentices. When this arrangement is used, the apprentice records are usually kept by a supervisor as part of his assigned duties. This provides a greater degree of flexibility in providing job instruction for apprentices, and follows a more normal arrangement in most industries by following the standard journeyman-apprentice relationship. The qualifications for apprentice instructors are defined as follows: having served an apprenticeship and possessing above-average qualifications as a craftsman; training and experience in teaching; and, particularly, information on the special techniques required in the learning-by-doing method. In smaller plants with fewer apprentices, it has been found useful to designate one individual (often a subforeman) who will work part-time on handling the operational or instructional problems of apprentices.

It is recommended that these items, together with other special provisions, including granting of credit for previous experience, hours of work, examinations, etc., should be set down in a written programme so that all concerned will know the elements of the scheme.

Selection of Apprentices

The local written apprenticeship programme, whether for a trade or plant, usually lays down the procedure by which apprentices are selected. As a rule there are more applicants for apprenticeship than openings to be filled. The requirements for admission vary with the trade to be learned and usually relate to such factors as age, education, physical condition, character and aptitudes.

So far as *age* is concerned, the most usual provision is to accept applicants between 16 and 24 years of age.[1] However, as noted previously, apprenticeship is not confined to such persons in all cases, and large numbers of older persons, especially war veterans, over the normal maximum age limit have entered apprenticeship within the last few years. In selecting apprentices, returning service men are usually considered to be the same age as they were when they entered military service.

[1] During the war, modifications were made in a great many programmes, removing or considerably raising the maximum age rule. One great advantage of using older persons for apprenticeship was that they could be given credit for previous experience or training and complete their apprenticeship sooner. Apprentices up to 40 years of age, and in some cases older, were employed satisfactorily.

A candidate's *physical condition* may, in certain circumstances, be tested by medical examination, which must take place within a stated period before beginning the apprenticeship. In principle, candidates are deemed to be in good physical condition if they possess the necessary physical ability to perform the work in the trade which they propose to learn. Thus, returned service

By courtesy of the U.S. Department of Labor. (Photo by James B. Lindley.)

A joint management-labour apprenticeship committee interviews an applicant to determine his qualifications for apprenticeship.

men with physical disabilities or other disabled persons may be, and are being, employed as apprentices in many trades where the work is suited to their residual capacity.

The *standard of education* required of apprentices tends to be high. In some cases, four years of satisfactorily completed secondary education is required, and in many cases at least the equivalent of a high school education is specified as desirable (*e.g.*, vocational school training or special instruction or work experience). In a number of cases, candidates without a full secondary education are accepted and complete their formal education while serving their apprenticeship.

As a rule, candidates for admission to apprenticeship must display an *aptitude for learning a skilled trade*. As an aid to selection,

increasing emphasis is being placed upon tests.[1] Certificates or records presented by the candidates are also used in estimating aptitude for learning the trade.

A general *preference in admission* to apprenticeship has been given to war veterans. Moreover, in many instances, preference in a particular trade apprenticeship programme is offered to sons and daughters of the workers in the trade, provided they can meet the general standards of selection. In new plant apprenticeship programmes, and in some of longer standing, preference is often given to present employees over outside applicants.

Apprentices are sometimes selected through the co-operation of the various State employment services or through co-operation between the apprenticeship committee or employer and the local schools, including the vocational schools.

The final selection is carried out by the employer or by the management-labour apprenticeship committee.

In theory, women are not excluded from apprenticeship because of their sex under most programmes, although in many cases they tend to be excluded by the physical requirements of the trade or by custom or tradition. Moreover, experience has shown that many women are not interested in long-term training for skilled work. At the time of writing, less than 1 per cent. of all registered apprentices were women.

Written Agreements of Apprenticeship

Each apprentice is employed under a written agreement, which sets forth the basic conditions of his contract of employment and training. The agreement is based on the standards set by the local joint trade apprenticeship committee, or by the employer where there is no committee, and is subject to the approval of this committee, or employer, and also of the State Apprenticeship Council (or the Federal Committee on Apprenticeship where no council exists). As a rule, the apprenticeship agreement states the name of the trade, the period of apprenticeship, the schedule of work processes to be learned, the graduated wage scale, the provision for related class-room instruction and other special provisions affecting the apprentice's employment and training. Another type of agreement used gives the name of the apprentice, the apprenticeship programme under which he is employed and the trade, and includes a provision

[1] One general test measures educational accomplishment in fields closely related to the trade. The type of test most frequently used is designed to show whether the applicant has a general aptitude for the trade and to measure manual dexterity.

under which the standards contained in the programme become a part of the agreement by reference, thus making it unnecessary to fill in a great deal of detail in the agreement form. This type of agreement is used most frequently in systems for a whole trade, particularly in the building trades, where the apprentice may work with several different employers during the course of his apprenticeship.

Registration of Agreements.

Under the local apprenticeship programmes, it is urged that each apprenticeship agreement, once it is drawn up and agreed to, should be registered with a State Apprenticeship Council or with the Federal Committee on Apprenticeship in the absence of such a Council. Registration is strictly voluntary on the part of employers and labour groups, however, though it is a condition for State or Federal acceptance of any programme as an approved programme. The registration procedure is designed and encouraged primarily for the following purposes :

(1) to safeguard the interests of the apprentice and to ensure conformity with local and plant apprenticeship programmes with agreed State and national standards for the trade ; and

(2) to make possible a State and national inventory of the total number of apprentices in training under approved programmes in each trade.

The Bureau of Apprenticeship considers that the registration of apprenticeship agreements with the State agency is an indispensable part of the national programme.

It has summarised the value of the procedure as follows :

> The review and registration of the individual agreements makes a public record of the fact that the apprentice is being employed and trained in an occupation and under standards recognised by industry and public agencies as being adequate to produce a qualified all-round skilled worker ; it provides a record against which the apprentice and future employers in later years can establish facts regarding the worker's training ; it serves as a check against the hiring of an apprentice who is under contract to another employer or of the employment of a worker as an apprentice without adequate credit for his previous experience ; and it provides the basis for the issuance by the State Council of certificates of completion of apprenticeship.[1]

Identification Cards.

When an apprenticeship agreement is drawn up and signed, the apprentice usually receives an identification card, showing his

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[1] U.S. Department of Labor, Apprentice-Training Service : *The National Apprenticeship Program* (Washington, 1947).

name, the trade being learned, the date of the beginning of apprenticeship, the name of the company or joint committee which is responsible for the training, the wage rate and the signature of an authorised member of the apprenticeship committee or the employer. These cards vary in the different plants and localities, and some include more detail on school progress, work experience, etc. Where identification cards are issued, the apprentice carries the card while in school and at work.

Duration of Apprenticeship

Period of Probation.

In most apprenticeship programmes, the apprentice serves a probationary period of three to six months. During this period, the apprenticeship agreement may be annulled by the joint trade apprenticeship committee, or the employer, on the request of either party to the agreement and without hearing. After the probationary period, the agreement may be cancelled by either party for reasonable cause. Experience to date indicates that apprentices, employers and State and Federal apprenticeship agencies do not attempt to use the apprenticeship agreement as a legal binding document. Notice of cancellations of agreements is given to the State Apprenticeship Council.

Term of Apprenticeship.

The term of apprenticeship varies from two to seven years, depending on the trade. The Federal Committee on Apprenticeship has defined the minimum term as 4,000 hours, or approximately two years. The average period is between three-and-a-half and four years. Trades requiring an apprenticeship longer than four years include those of printer and compositor, pattern maker, die sinker, pipe fitter, plumber and engraver.

When apprentices are required to work overtime, the actual hours worked may be credited towards the total term of apprenticeship. As a rule, time lost in any one year must be made up before the apprentice moves into the next higher wage class.

The required term of apprenticeship is modified in certain circumstances. For example, it is quite a common practice for apprenticeship committees to evaluate any previous experience an applicant may have had and to allow a certain amount of credit, which is applied to shorten the standard required term of apprenticeship. Previous experience for which credit is allowed may in-

clude that which is gained either in military service or in a related civilian type of work. Whenever credit is allowed, the apprentice is advanced to the period to which the credit entitles him and is paid the corresponding wage rate. In some cases, moreover, apprentices may be advanced more rapidly than in accordance with the usual schedule, on the basis of examinations which demonstrate exceptional achievement.

Content of Training

Schedule of Work Processes.

Each apprenticeship agreement conforming to approved standards should include a schedule of work processes, setting forth the approximate amount of time the apprentice should spend learning each process. The schedule is flexible to allow for individual differences in the time taken to learn the different processes, and also to meet differences among plants in the facilities available for apprentice training. The schedule included in a textile machinists' apprenticeship training programme is given below, as an example of a flexibly planned schedule of the work processes to be learned during apprenticeship.

	Weeks
Tool room	4
Drill press	8
Power saw	4
Power press	4
10″ engine lathe	20
26″ engine lathe	20
Grinding (tool and universal)	4
Shaper	10
Planer	10
Milling machine	24
Automatic gear cutting	18
Slubbing machine	24
Bench work	22
Outside work	12
Welding (oxy-acetylene, electric and metallising)	12
Heat treating	4
Total	200 (or 8,000 hours)

The above schedule of work experience is accepted to mean that the apprentice will be trained on all classes of work involving all of the basic operations performed with each of the basic machine tools or in each of the activities listed. In the application of this schedule, it is a common practice to divide the main heads into a more detailed schedule for the various divisions of the

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trade. Since this has to be worked out with the workshop concerned and involves giving consideration to the scheduling of the work and classes of work that are suitable for training purposes, it is not always practical to develop this detailed schedule when the programme is being formulated.

To prepare a more detailed work schedule for apprentices which will follow the major divisions of the trade as provided in the established programme of apprenticeship, two methods are used. One method provides for a complete trade analysis. Each major division of the trade is broken down into the basic operations of the trade, and this breakdown is used as a guide to determine whether the planned work schedule provides ample opportunity for the apprentice to learn the required skills for each segment, operation or machine involved in the trade. The analysis is then used as an apprentice record. It may be made by the plant training supervisor, the industrial relations department staff or other experts, in some cases brought in from outside.

The procedure of the job training analysis in relation to the training of apprentices is as follows :

(1) Describe jobs in sequence and in detail so that proper units for training can be determined.

(2) Show relationship of jobs so as to reveal progression of training for establishing the movement of the worker from one process to another.

(3) Show what supplementary information is needed for successful performance of the work, and whether it can best be given on the job or in the classroom.

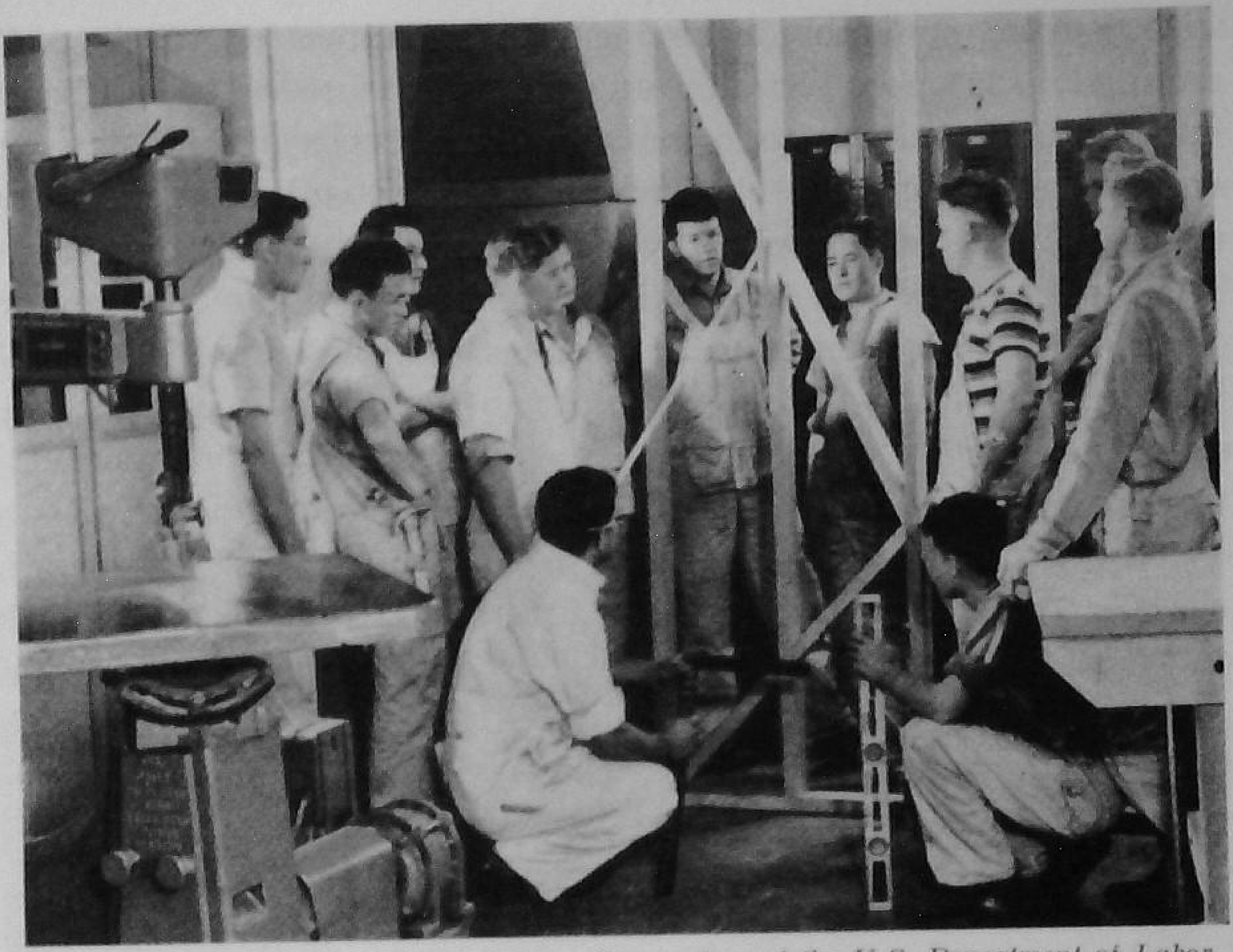
(4) Show the amount and type of experience and training required of the new worker, including the need for pre-employment or pre-production training where such a need exists.

(5) Provide complete and accurate information, for the use of plant training directors or supervisors, on the way the job is done.

(6) Describe some of the physical characteristics required of the new worker.

The other method, which is related to the trade analysis, is an analysis of the product for the purpose of selecting the proper assignments and work stations for the apprentice ; this serves as a guide in determining whether the required skills of the trade are covered in his work schedule. It is related to the first method in that an analysis is made of the product or work to be done for the purpose of meeting the requirements of the trade analysis.

For most industries, the work schedule does not have to be very detailed, because the methods of doing the work and the work assignments of apprentices while employed and working



By courtesy of the U.S. Department of Labor

Carpenters' apprentices.

By courtesy of the U.S. Department of Labor.
(Photo by James B. Lindley.)

An automechanic apprentice.

with journeymen provide as accurate an indication of the skills required as a more detailed analysis. Because of the difficulty in maintaining accurate records in some types of industry, the apprentice's progress is checked periodically, and assignments are made where there appears to be a deficiency in his work experience. The method used has to be determined in the light of the needs of the industry. However, as a rule the industry which usually has most difficulty in maintaining an accurate record of work experience tends to offer the best opportunity for apprentice training. For this reason, a great deal of discretion has to be exercised in preparing any analysis, and in relating this to the work schedule for apprentices. A good example of this is the contract machine shop, in which few jobs are alike and which offers one of the most varied work experiences possible for the training of apprentices, provided it possesses adequate tools and equipment.

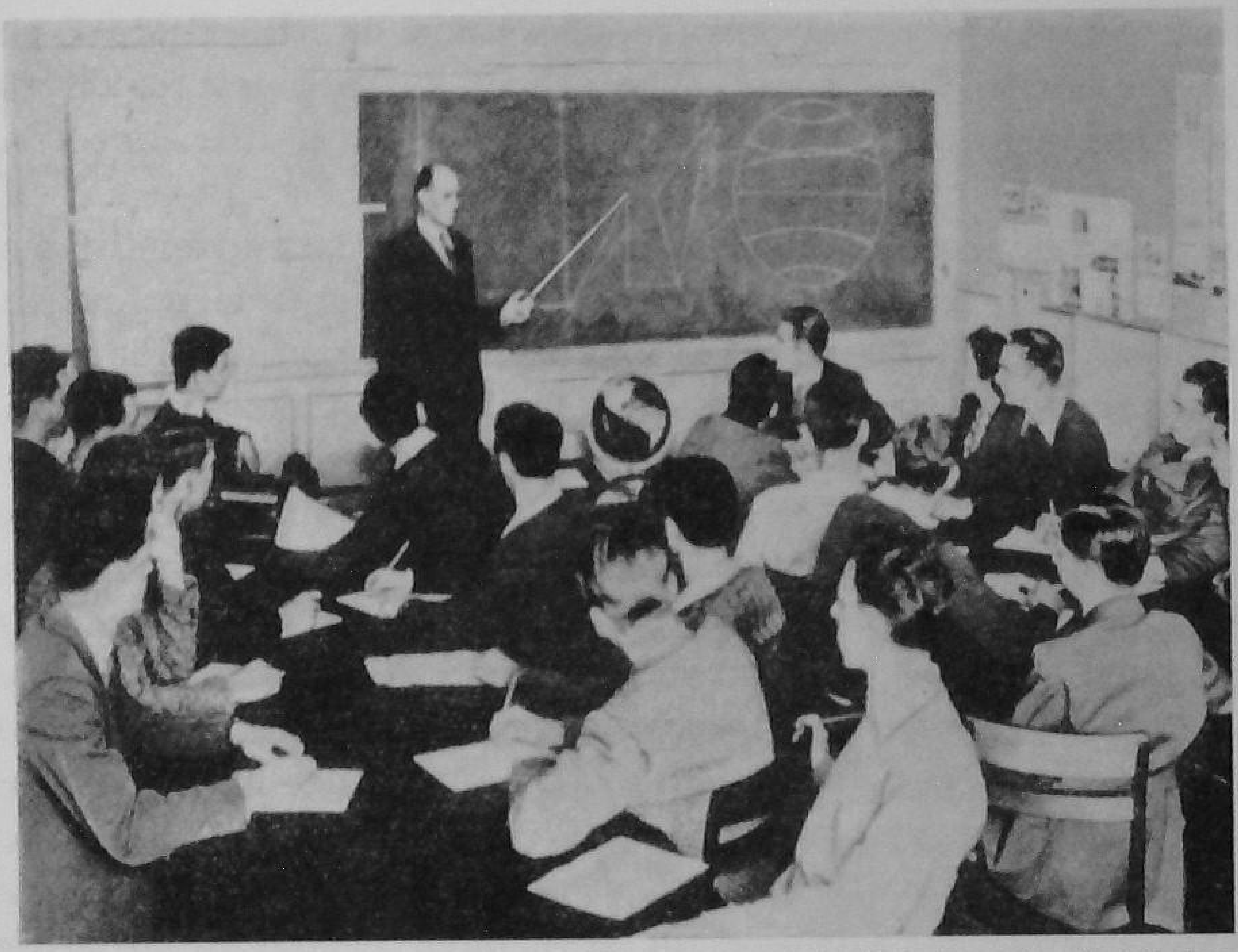
Related Instruction in Vocational Schools.

In addition to the work experience provided on the job, every apprentice training under an approved agreement should receive related supplementary classroom instruction for a minimum of 144 hours per year, or about 4 hours a week during each year of his apprenticeship. This is the minimum usually considered necessary. Recently there has been a tendency to increase the hours of related instruction in some trades. The task of providing an appropriate course of related instruction for each apprentice is sufficiently vast to tax the resources of the public vocational schools, especially in view of the large-scale expansion of apprenticeship since the war. As a result, many apprentices are not receiving proper related instruction because local facilities for such instruction are not available.

The related classroom instruction is usually provided by a local public vocational school under the administration of the vocational educational authorities. The subjects to be taken by the apprentice (for example, mathematics, draughtsmanship, blueprint reading, physics and other sciences relating to work in the trade) are often listed in the written apprenticeship standards for the trade along with the name of the school in which instruction is to be given, the method of securing qualified instructors and the standards of theoretical work which the apprentice must meet. In addition to the related trade subjects, apprentices are given instruction in labour and safety laws and regulations. In

some apprenticeship programmes, credit may be given for approved related instruction taken before entering into apprenticeship.

The methods of providing the related training include classroom discussions and lectures, demonstrations, moving pictures and other visual education. The Trade and Industrial Education Service of the U.S. Office of Education acts as a liaison and co-



By courtesy of the U.S. Department of Labor.

A group of machinists' apprentices take notes during classroom instruction.

ordinating agency with the State Board for Vocational Education, compiling information, and co-operating with and assisting the States on occupational information. The State Boards and the local school administrators are responsible for developing the instructional material to be used in related instruction classes for apprentices. Outstanding work has been accomplished by several States along this line, but a lack of adequate funds has restricted both the development and the distribution of the material. At the present time there are 48 apprenticeable trades for which instructional material is available outside the State which prepared it. The Office of Education is now working on a plan for obtaining sufficient funds to contract with the various States for the preparation of course outlines on a uniform pattern for all the apprenticeable occupations.

Under a considerable number of apprenticeship programmes, apprentices are paid by their employers for the hours spent in classroom instruction, and in at least one State employers are required to pay for these hours. As a rule, these hours do not count towards the completion of the required apprenticeship period, although they are a condition for the satisfactory completion of apprenticeship. Failure to attend classes and to do the work competently may involve suspension or revocation of the apprenticeship agreement. The school authorities provide the apprenticeship committee with a record of class attendance and with progress reports for each apprentice.

As a rule, special classes are held for apprentice training purposes in the vocational schools, either in part-time or evening classes. These classes are established for apprentices, though in many instances arrangements are made for others employed in the same industry to attend. In some States, a supervisor or co-ordinator of apprentice training has been appointed to deal with problems arising out of the organisation of related instruction for apprentices through the vocational schools — for example, to ensure that adequate instructional materials are available, that apprentice training is properly supervised, that progress records are made out and forwarded to the apprenticeship committees in respect of each apprentice, etc.

In some cases, the related instruction is provided through plant educational facilities (in very large plants, for example) or through private vocational or technical school facilities.

Correspondence courses or other self-study schemes are sometimes employed for apprentices in isolated areas, where no school facilities are available, or for apprentices in certain trades, to encourage uniform standards of competency.[1]

Conditions during Apprenticeship

Wages.

The apprentice receives wages throughout the period of apprenticeship. As a rule, these are calculated as a percentage of the journeyman's rate. The advantage of stating the apprentice's wages in these terms is that fluctuations in the journeyman's rate are automatically taken into account. The apprentice's wages increase periodically over the required period of apprenticeship (for example, at six-monthly intervals) in such manner as

[1] See below, Chapter VI.

to average, as a rule, about 50 per cent. of the journeyman's rate.[1] For the last six months he may receive as much as 85 or 90 per cent. of this rate. A typical apprentice wage schedule is as follows :

Stage of apprenticeship	Percentage of journeyman's rate
First 6 months	40
Second 6 months	45
Third 6 months	50
Fourth 6 months	55
Fifth 6 months	60
Sixth 6 months	70
Seventh 6 months	80
Eighth 6 months	90

It has been found that if the wage paid to apprentices is too low, the best recruits are not drawn to enter apprenticeship. On the other hand, if it is too high, the apprentices tend to be placed on production work with meagre training content and foremen tend to dislike the placement of apprentices in their departments.

Incentive wage schemes are not usual for apprentices, and are not encouraged primarily because it is feared that they might have a bad effect on the quality of the training and the work done. However, in some cases such schemes may apply to adult apprentices, for example, those entering as ex-service or advanced apprentices. Under some plant apprenticeship schemes, an effort is made to give apprentices experience of conditions of production in which wages vary with output : apprentices who have already served a fixed minimum period of their term are given a bonus above their basic rate on certain jobs. Indirect wage incentives may also be used, such as the provision of tool-kits and bonuses on satisfactory completion of apprenticeship, etc.

Hours.

As a rule, apprentices work the usual hours for journeymen. In some cases they are permitted to work night shifts. They may work overtime but, as noted, this may or may not count towards completion of their apprenticeship period, depending on what the apprentice programme standards specify.

Hours spent in related classroom instruction given outside working hours may be counted towards the completion of the term of apprenticeship, as determined by each apprenticeship agreement.

[1] Actually, in most industries, the average is considerably higher than 50 per cent. of the journeyman's rate.

Safety and Hygiene.

It is recommended that apprenticeship programmes should include provision for safe and wholesome working conditions, *i.e.*, standards of safe practice, proper machine guarding, safety instruction, sanitation and protection against occupational disease. Safety instruction is stressed throughout the period of apprenticeship training, both in on-the-job training and in the related classroom instruction.

Appeal Channels.

In some programmes, as a generally recommended procedure, there is a specific channel through which apprentices may take up their problems during training. As a rule, the apprentice has first to discuss the question with his immediate supervisor, but if he is not satisfied with the decision reached, he is usually in a position to appeal to the apprentice supervisor. In most cases, he can also bring the matter before the plant management-labour apprenticeship committee or the local joint trade committee.

Supervision and Examination of Apprentices

Supervision during Apprenticeship.

Supervision of the apprentice's progress is particularly stressed. During his training on the job, he works at all times under the supervision of a fully qualified craftsman and, in many cases, under a craftsman who has received special instruction in the training of apprentices. In the larger apprenticeship programmes there is usually a supervisor of apprentices who sees to it that apprentices are kept on their training schedules. In smaller programmes this responsibility is placed on someone on a part-time basis. While in school the apprentice is under the supervision of the local school authority, which, in turn, attempts to co-ordinate the school programme with the type of work the apprentice is doing on the job. One of the important functions of the joint management-labour apprenticeship committees (local and plant) is to examine the progress of each apprentice employed under a registered agreement.

Examination of Apprentices.

As a rule, the apprenticeship committee may examine the record of any apprentice before each period of advancement or at

any other time considered appropriate, giving consideration to school attendance, progress in learning the work processes and in theoretical study, observations of the work supervisor, etc.

In some cases, there is a standard examination at the completion of the apprenticeship period, while in other cases the completion of the required period of apprenticeship is considered to be sufficient evidence of the standard of training.

In some trades (air mechanics, plumbers, etc.) the apprentice must obtain a licence issued by the appropriate public authority before he may take regular employment as a journeyman in the trade.

Apprenticeship Certificate.

Upon completing satisfactorily the required apprenticeship period, the apprentice is recognised as an all-round skilled worker. In recognition of this status, he is awarded a certificate of completion of apprenticeship, which corresponds to the diploma awarded to graduates of a school or college. This certificate is issued by the State Apprenticeship Council or, in States lacking such a council, by the Federal Committee on Apprenticeship. In addition to these certificates, the employer or management-labour committee in many cases issues one of its own.

Conclusions

(Prepared by the Director of the Bureau of Apprenticeship of the U.S. Department of Labor.)

The following have been suggested as the major principles and objectives of the national apprenticeship programme in the United States which have contributed to the progress of the programme, and which may be of most interest to those in other countries who are interested in apprenticeship.

Objectives

To provide opportunities for training through apprenticeship to young persons (16 to 24 years) and to a limited number of older persons ; to safeguard the welfare of apprentices ; and to bring about a better relationship between employers and workers in the area of industrial training.

Principles

(1) *Voluntary Action.*

The objective is attained through securing constructive voluntary action on the part of management and labour, with Government providing initiative and assistance, but no regulation. The minimum standards formulated by the Federal Committee on Apprenticeship for the Bureau of Apprenticeship apply only to those who elect to comply with them.

(2) *Management-Labour Co-operation.*

Probably the most significant factor in the growth and progress of the apprenticeship programme has been the co-operation which has been brought about between management and labour at the local, State and national levels on the training of apprentices.

The apprenticeship programme was planned on the principle that there is a mutual interest between the employers and the workers in proper standards for the employment and training of apprentices. The employer supplies the job and the facilities for training ; and the workers impart the skills they have to the apprentices. Therefore, their joint co-operation is vital to constructive action. Management and labour, through the medium of the joint apprenticeship committee, develop their own programmes, adapted to their particular needs, which conform with recommended State and Federal standards ; they are responsible for keeping the programme going. The influence of the management-labour apprenticeship committee in a community is felt in a number of ways, including securing community understanding of the value of training for the skilled trades and support for such training, encouraging other groups to take similar action and providing training for young people to fit them for profitable employment and responsible citizenship.

The national trade approach, described in the foregoing part of this report dealing with national joint apprenticeship committees, has proved to be a most sound approach in enlisting the co-operating and active support of local groups and in setting a recommended pattern for apprenticeship for the trade.

(3) *Governmental Stimulation.*

Both the Federal and State apprenticeship agencies function as promotional and advisory groups. They provide the necessary stimulation to bring employers and workers together on appren-

ticeship. Through their staff of field representatives they assist industry directly with the planning and organisation of their programmes and provide a continuing follow-up and maintenance service to assure reasonably high quality performance.

In addition to having a field staff which gives direct technical service in setting up apprenticeship programmes, the Bureau of Apprenticeship also functions as a clearing house for information; provides national liaison with other interested Federal agencies and national employer and employee organisations; provides statistical service to the States and to industry; and prepares pamphlets, articles and releases on apprenticeship accomplishments. It is thus bringing about a nationally integrated apprenticeship programme.

Annex

Apprenticeable Occupations

The following list of apprenticeable occupations[1], showing also the customary periods of apprenticeship, is given in alphabetical order of the basic trade classifications; where a classification includes several occupations, these are listed under it. The industrial or trade group is specified within brackets.

Aircraft fabricator; final assembler (aircraft manufacturing), 3-4 years.

Airplane mechanic (air transportation; aircraft manufacturing), 3-4 years.

- Accessories mechanic.
- Airplane mechanic.
- Electrical mechanic.
- Engine mechanic.
- Instrument mechanic.
- Line-service mechanic.
- Propeller mechanic.
- Radio mechanic.
- Sheet metal mechanic.

Asbestos worker (construction), 4 years.

Automobile-body builder (auto manufacturing), 4 years.

- Custom truck-body builder.
- Sample-body builder, metal.
- Sample-body builder, wood.

Automobile-body repairman or body-and-fender mechanic (auto services), 3-4 years.

Automotive mechanic (auto services), 3-4 years.

- Automobile mechanic.
- Bus mechanic.
- Motorcycle repairman.
- Tractor mechanic.
- Trick mechanic.

Baker (bakery products; hotel and restaurant), 3 years.

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[1] See above, p. 69.

BARBER (personal service), 2-3 years.

BLACKSMITH (any industry), 4 years.

BOILERMAKER (any industry), 4 years.
Mould loftsman or template maker (shipbuilding).
Ship fitter (shipbuilding).

BOOKBINDER (printing and publishing):
Bindery worker, male, 4 years.
Bindery worker, female, 2 years.
Ruler, 3 years.

BREWER (malt liquors), 2-3 years.

BRICKLAYER or brickmason (construction), 3 years.

BUSINESS MACHINE MECHANIC (any industry), 3 years.

BUTCHER; MEATCUTTER (slaughtering; meat packing):
Butcher, 3 years.
Meat cutter, 3 years.

CABINETMAKER-MILLMAN (any industry):
Airplane woodworker (aircraft manufacturing), 3-4 years.
Cabinetmaker or bench carpenter or furniture maker (woodworking; furniture), 3-4 years.
Casket maker (mortician goods), 2-3 years.
Millman; shop carpenter (woodworking), 3-4 years.

CANDY MAKER (confectioners), 3-4 years.

CANVAS WORKER (any industry), 3 years.
Sailmaker (shipbuilding).
Tent awning maker (canvas goods).

CARMAN (locomotive and car building), 4 years.

CARPENTER (any industry), 4 years.
Boatbuilder, wood (shipbuilding).
Carpenter (construction).
Carpenter, maintenance (any industry).
Joiner (shipbuilding).
Mould maker, wood (brick and tile).
Shipwright (shipbuilding).

CEMENT FINISHER (construction), 3-4 years.

COOK (hotel and restaurant), 3 years.

COOPER (cooperage), 4 years.

COSMETICIAN or beauty operator (personal service), 2 years.

DAIRYMAN (dairy products), 2-3 years.

DENTAL MECHANIC (business services), 3-4 years.
Dental plate maker.
Metal denture maker.

DESIGNER (any industry), 5 years.
Bank-note designer (printing and publishing).
Tool-and-die designer (machine shop).

DRAUGHTSMAN (any industry), 3-4 years.
Mechanical draughtsman.
Architectural draughtsman.

DRY CLEANER (cleaning, dyeing, and pressing), 3-4 years.

ELECTRICIAN (any industry), 4-5 years.
- Cable splicer (light and power ; construction).
- Electrical repairman ; maintenance electrician (any industry).
- Electrician (construction).
- Lineman (light and power).
- Meter tester and repairman (light and power).
- Power-house electrician (light and power).
- Radio electrician (any industry).
- Repairer and winder (any industry).
- Ship electrician (shipbuilding).

ELECTROPLATER (any industry), 3-4 years.
- Aircraft plater (aircraft manufacture).
- Plater (electroplating).

ELECTROTYPER (printing and publishing), 5-6 years.
- Electrotype moulder.
- Electrotype finisher.

ELEVATOR MECHANIC (construction), 4 years.

ENGRAVER (any industry) :
- Engraver-chaser or pantograph engraver (jewellery), 3-4 years.
- Engraver ; steel and copperplate engraver ; bank-note engraver (printing and publishing), 5 years.
- Etcher (printing and publishing), 5-6 years.
- Metal engraver (engraving), 4-5 years.

FARM EQUIPMENT MECHANIC (auto services), 3-4 years.

FILM TECHNICIAN, MOTION (business services), 3 years.

FLOOR COVERER (construction), 3-4 years.
- Linoleum, soft tile and carpet layer.

FOUNDRYMAN (foundry) :
- Core maker, 4 years.
- Melter, 2-3 years.
- Moulder, through 4 years.

FURRIER (fur goods) :
- Fur-machine operator, 2-3 years.
- Fur finisher, 2-3 years.
- Fur cutter, 3-4 years.
- Furrier, 3-4 years.

GLASS BLOWER or bender (any industry) :
- Glass blower (glass manufacturing), 3 years.
- Glass blower, laboratory apparatus (instruments and apparatus), 3-4 years.
- Neon-tube bender (signs), 3-4 years.

GLASS WORKER (any industry) :
- Glass worker, shop (glass products ; construction), 3-4 years.
- Glassware engraver (glass products), 2-3 years.

GLAZIER (any industry) :
- Automobile glazier (auto services), 2 years.
- Glazier (construction), 3 years.

HEAT TREATER (heat treating), 4 years.

IRON WORKER (any industry) :
- Iron worker, shop (construction ; structural metals), 3-4 years.
- Ornamental iron worker ; bronze worker (construction), 4 years.
- Reinforcing iron worker (construction), 2 years.
- Structural steel worker (construction), 2-3 years.
- Template maker (structural metals), 3-4 years.

JEWELLER (jewellery):
- Caster-mould maker, 3-4 years.
- Die maker or hub cutter, 3-4 years.
- Enameller, 2-3 years.
- Engraver-chaser, 3-4 years.
- Goldsmith, 3-4 years.
- Jeweller, bench hand, 3-4 years.
- Lapidary or stone cutter, 3-4 years.
- Polisher, 3-4 years.
- Spinner, 3 years.
- Stamper, drop hand, 2-3 years.
- Stone setter, 3-4 years.

JIG AND FIXTURE BUILDER (aircraft manufacturing, auto manufacturing), 4 years.
- Jig and fixture builder (aircraft manufacturing).
- Jig and fixture builder (auto manufacturing).
- Wood-tool maker (aircraft manufacturing).

KNITTER, FULL-FASHION (hosiery), 3 years.

LATHER (construction), 3-4 years.

LEAD BURNER (chemical; petroleum refining; shipbuilding), 4 years.

LEATHER WORKER (leather products), 3 years.
- Glove cutter.
- Harness maker.
- Saddle maker.

LITHOGRAPHER (printing and publishing), 4-5 years.
- Artist or process artist.
- Camera man or photolithographer.
- Platemaker.
- Lithographic pressman.

LOCOMOTIVE REPAIRMAN (locomotive and car building), 4 years.

MACHINIST (any industry), 4 years.
- Automobile machinist (auto services).
- Instrument maker (any industry).
- Machinist (machine shop).
- Maintenance machinist or machine repairer (any industry).
- Marine machinist (shipbuilding).
- Mould maker (glass manufacturing; rubber tire; brick and tile).

MAILER (printing and publishing), 4-5 years.

MAINTENANCE MECHANIC (any industry), 3-4 years.
- Construction equipment mechanic (construction).
- Linotype machinist (printing and publishing).
- Knitting-machine mechanic (hosiery; knit goods).
- Pump mechanic (any industry).
- Sewing-machine mechanic (any industry).
- Wind-tunnel maintenance mechanic (aircraft manufacturing).

MARKING-DEVICE MAKER or rubber stamp maker (marking devices; printing and publishing), 2-3 years.

MATTRESS MAKER (mattress), 2-3 years.

METAL SPINNER (machine shop), 3-4 years.

MILLER (grain mill), 4 years.

MILLWRIGHT (any industry), 4 years.

MODEL MAKER (any industry), 4 years.
- Model maker (aircraft manufacturing).
- Model maker (auto manufacturing).

Model maker (electrical equipment).
Model maker (jewellery).

MOTORBOAT MECHANIC (any industry), 2-3 years.

MUSICAL INSTRUMENT REPAIRMAN (any industry), 3-4 years.

OPERATING ENGINEER (construction), 3-4 years.

OPTICAL TECHNICIAN (optical goods), 4 years.
Surfacer ; lens grinder.
Finisher ; benchman ; mounter.
Precision-lens grinder.

ORTHOPEDIC TECHNICIAN (surgical appliances), 3-4 years.
Artificial-limb maker, metal.
Artificial-limb maker, wood.
Brace maker.
Fitter.
Leather worker.

PAINTER (any industry):
Aircraft painter and doper (aircraft manufacturing), 2-3 years.
Automobile painter (auto services), 3 years.
Furniture finisher (furniture), 2-3 years.
Painter (construction), 3 years.
Painter (shipbuilding), 3 years.

PAINT MAKER (paint and varnish), 3-4 years.

PAPER-GOODS MAKER (paper goods), 4 years.
Die maker, paper.
Paper goods machine adjuster.

PATTERNMAKER (foundry), 5 years.
Metal patternmaker.
Wood patternmaker.

PHOTO-ENGRAVER (printing and publishing), 5-6 years.
Copper etcher.
Finisher.
Photographer.
Proofer.
Roto plate-grinder.
Roto printer-transferrer.
Roto retoucher.
Roto stager.
Router and blocker.
Stripper and printer.
Tint layer or Ben-Day artist.
Zinc etcher.

PHOTOGRAPHER (any industry), 3 years.
Commercial photographer.
Portrait photographer.

PIANO REPAIRMAN (any industry), 4 years.

PIPE-ORGAN MECHANIC (any industry), 4-5 years.

PLASTERER (construction), 4 years.
Artificial marble or imitation stone worker.
Caster.
Modeller.
Model maker.
Plasterer.
Sculptor.

PLATE PRINTER (printing and publishing), 4 years.

- Die stamper.
- Plate printer.

PLUMBER-PIPE FITTER (any industry), 4-5 years.

- Gas fitter.
- Pipe fitter.
- Plumber.
- Plumber-steamfitter.
- Sprinkler fitter.
- Steam fitter.

POLISHER AND BUFFER (any industry), 3-4 years.

POTTERY WORKER (pottery and porcelain), 3 years.

- Caster.
- Decorating kiln placer.
- Dipper.
- Handler.
- Jiggerman.
- Kiln drawer.
- Kiln placer.
- Liner.
- Mould maker.
- Packer.
- Sagger maker.
- Tinter.
- Turner.
- Warehouseman.

PRINTER (printing and publishing), 5-6 years.

PRINTING PRESSMAN (printing and publishing), 4-5 years.

- Cylinder pressman.
- Offset pressman.
- Press assistant.
- Rotary pressman or web pressman.

REPAIRMAN (any industry):

- Camera repairman, 3 years.
- Electrical instrument mechanic or repairman, or pyrometer man, 4 years.
- Diesel repairman, 4 years.
- Gas-engine repairman, 3-4 years.
- Gunsmith, 3-4 years.
- Instrument repairman, 4 years.
- Locksmith, 3-4 years.
- Neon sign repairman, 3-4 years.
- Radio repairman, 3-4 years.
- Scale repairman, 3 years.
- X-ray equipment repairman, 3-4 years.

RIGGER (any industry), 2-3 years.

ROLL TURNER (iron and steel), 4 years.

ROOFER (construction), 3 years.

- Composition roofer.
- Slate and tile roofer.
- Damper and waterproofer.

SHEET METAL WORKER (any industry):

- Coppersmith (sheet metal), 4 years.
- Coppersmith (shipbuilding), 4 years.
- Sheet metal worker (sheet metal ; construction), 4 years.

Sheet metal mechanic or aviation metalsmith (aircraft manufacturing; air transportation), 3-4 years.
Sheet metal worker (shipbuilding), 4 years.
Steel boatbuilder (shipbuilding), 4 years.

SHIP RIGGER (shipbuilding), 3-4 years.

SHOEMAKER or bootmaker (personal service), 2-3 years.
Bootmaker.
Shoe repairman.

SIGN PAINTER (any industry), 3-4 years.

SILVERSMITH (silverware):
Silversmith, 4 years.
Solderer, 3-4 years.

SPINNER (textile), 2 years.

STAINED GLASS WORKER (glass products), 4 years.
Stained glass artist.
Stained glass glazier.

STATIONARY ENGINEER (any industry), 3-4 years.

STEREOTYPER (printing and publishing), 5-6 years.

STONEMASON (construction), 3 years.
Stonemason.
Stone setter or marble setter.

STONE WORKER (stoneworking):
Monument maker; stone carver, 3 years.
Stone cutter; granite cutter, 3-4 years.
Stone polisher, 2-3 years.

STOVE MOUNTER (stove), 3 years.

TAILOR (garment):
Alteration tailor; ready-to-wear tailor; bushelman, 2 years.
Cutter, 4 years.
Finisher; tailoress, 2 years.
Sample maker, 3-4 years.
Tailor, 4 years.

TANNER (leather manufacturing), 2-3 years.

TELEPHONE WORKER (telephone and telegraph), 4 years.
Cable splicer.
Central-office installer.
Combination man.
Lineman.
PBX installer.

TERRAZZO WORKER (construction), 3 years.

TEXTILE-MACHINES MECHANIC (textile), 3-4 years.
Card-room mechanic.
Spinning-room mechanic.
Warp-preparation mechanic.
Weave-room mechanic.

TILE SETTER (construction), 3 years.

TOOL AND DIE MAKER (machine shop):
Die maker, 4-5 years.
Die sinker, 7 years.
Gauge maker, 4-5 years.
Tool maker, 4-5 years.
Trimmer-die maker, 3 years.

UPHOLSTERER (any industry), 3-4 years.

Automobile upholsterer (auto services).
Upholsterer (furniture).
Upholstery repairman (any industry).

WALLPAPER CRAFTSMAN (wallpaper):

Colour mixer, 4 years.
Print cutter, 5 years.
Sketch maker, 5 years.
Wallpaper printer, 4 years.

WATCHMAKER (any industry), 3-4 years.

WEAVER (textile), 2-3 years.

WIRE WEAVER (wirework), 2-3 years.

WOOD CARVER (any industry), 3-4 years.

CHAPTER IV

IN-PLANT TRAINING CONDUCTED BY PRIVATE UNDERTAKINGS

Many private undertakings train their own workers on the job in both shop and technical subjects. In fact, the maintenance of in-plant training programmes, organised and operated by private industrial undertakings without public supervision or support of any kind (except at the request of the undertakings themselves), is probably the most characteristic feature of United States training schemes for adult workers. Nevertheless, it is impossible to draw a comprehensive picture of the many and varied plant training schemes now in operation in large and small undertakings in the different industries and areas of the country. This chapter, therefore, consists of a short general survey of company training schemes, followed by a brief description of several successfully operating plant training schemes, in the hope that the descriptions may at least indicate the type of plant training schemes on which material can be made available.

A. Brief General Survey

As noted above, it is impossible to describe accurately, in general terms, the in-plant training activities of industrial establishments in the United States. The in-plant training programmes vary in many respects from one company to another — even within the same branch of industry (such as electrical work, automobile manufacturing or cotton textiles). Moreover, in many cases, while the wartime training arrangements have faded away since the end of the war, the long-term post-war pattern of training has not yet taken shape. The training of war veterans has been fitted, as a short-term measure, into schemes whose basic lines are still fluid. The purpose of this part of the monograph is to suggest briefly the general aspects of privately conducted in-plant training programmes.

It should be noted at the outset that the successful plant training schemes develop out of the industrial operations of the plant concerned. Unless such schemes are planned and carried out as an integral part of these operations, they tend to become an industrial extra whose continued existence is consequently uncertain. Moreover, the success of the schemes really depends on each part of the staff of the plant—from the top management down through each supervisor, foreman and skilled worker. Where each person is concerned with training as a specific part of the functions of his job, and knows his responsibility in the matter, there the training becomes a part of the plant's productive life. Where this is not the case, training remains an undigested element of the programme and contributes little to the advancement of the technical " know-how " of the workers or the level of operations of the industry.

Moreover, experience has also indicated that plant training must be conducted in co-operation with the workers concerned. Where their representatives are given an opportunity to participate in the planning and execution of the scheme, the chances of its success are greatly increased. This is a basic principle of in-plant training and one to which both management and trade unions attach the greatest importance.

Finally, it might be noted that, while many of the best known plant training schemes are in large corporations, a great many others are in smaller companies. The size of the plant affects the extent of the training programme but does not alter the principles of plant training.

Objectives of Plant Training Programmes

In most of the plants with training programmes in operation, it is considered important to define clearly the aims of the training scheme in relation to the productive operations of the industrial enterprise concerned. A definition of objective has been found to facilitate the planning and carrying out of the programme.

The stated aim of most plant training schemes is to combine increased technical know-how with increased production. The National Industrial Conference Board, which made a fairly comprehensive study of company programmes before the war, pointed out the basic reason for the maintenance of training programmes.

Increasingly, industry is recognising that to disregard the need for training does not eliminate it, but merely perpetuates the ineffective

training through trial and error that already exists. Planned programmes of employee development are no longer thought of as something new in an organisation, but simply as more productive management methods for ensuring the efficient job performance which had previously been left to chance.[1]

Some of the specific results which management expects from training programmes may be listed as follows [2] :

Improvement in leadership.
Better morale.
Constructive discipline.
More efficient organisation.
More harmonious work relations.
Better job performance and greater efficiency.
Reduction in grievances.
Reduction in absenteeism and turnover.
Better informed employees.
Better handling of employees.
Better workplaces.
Improved methods of operation.
Shortened learning time.
Increased production.
Reduced waste and rejects.
Better utilisation of manpower.
Better job understanding.
Minimum of labour troubles.

Types of Training and Categories of Trainees

The principal types of in-plant training programmes in United States industry have been classified as follows by the National Industrial Conference Board :

(1) all classroom training, in which practically all the training is conducted within classrooms of the company's premises ;

(2) all "vestibule" training, where the tools and machines are brought to the trainees in a separate room or part of the plant in which the plant working conditions are reproduced (on a small scale) as nearly as possible ;

(3) part classroom and part vestibule training—a combination, in various proportions, of types (1) and (2) above ;

(4) all on-the-job training, in which almost the entire training is conducted in the shop under regular production and working conditions, with the trainee "learning by doing" and through instructional supervision ;

(5) part classroom and part on-the-job training—a combination of types (1) and (4) above.

In a survey of company training programmes made in 1943, the following general classification according to the above types of training was made :

Type of training	Number of companies
(a) Part classroom and part on the job	96
(b) All classroom	30
(c) Part classroom and part vestibule	24
(d) All on the job	13
(e) All vestibule	3

[1] See National Industrial Conference Board, Studies in Personnel Policy, Nos. 15, 18, 37, 49, 55 and 66. These and other publications of the Board have been extensively drawn upon in the preparation of the present chapter.

[2] Cf. C. R. Dooley, *op. cit.*

A number of companies combine two or three types of training for different kinds of jobs ; and some of these use a combination of the same two types, namely, *(a)* and *(c)*.

At present, in-plant training programmes seem to be concentrating attention on the training of supervisory staff. This emphasis corresponds to longer-term industrial trends — in particular, the trend towards simplification of the work and the breakdown of jobs into their simplest component operations — a trend which was greatly accentuated during the war and which constituted the point of origin of many of the wartime training schemes. As a result, supervisory staff are trained to teach and to deal with production workers, who receive more systematic on-the-job instruction and less general and formal training apart from that. The current trend thus appears to be towards more on-the-job training and less classroom instruction or towards a combination of the two, with greater time and emphasis given to the on-the-job training.

The plant training programmes are usually designed to serve the many different categories of workers in the company's labour force. In fact, it has been found inadvisable to exclude any large groups of workers from the coverage of the programmes.

As a rule, the company programmes provide special or supplementary training courses for *(a)* supervisory staff, *(b)* technicians, and *(c)* apprentices or other young learners, and supplementary training for *(d)* employed production workers. However, as can be seen from the examples included later, the coverage of the programmes varies from one company and plant to another.

Company Training of Supervisory Staff, including the Training of Job Instructors

Plant training programmes for supervisory staff are probably the most common type of in-plant training activity. There are various kinds of supervisory training programmes, with differing aims, content and method. The subject is one which has received considerable attention from American management during the last decades, and since the war a number of interesting developments have taken place.

In general, the present tendency seems to be towards providing more systematic training for newly appointed supervisory staff and towards giving continued supplementary training so far as practicable, so that the programme reaches almost the entire

supervisory personnel of the plant or company, as the case may be. Special emphasis is being placed *(a)* on teaching supervisors how to teach those working under their supervision to do their jobs efficiently, and *(b)* on helping supervisors to deal more realistically with personnel problems, by directing more attention to the individual and his specific interests. There are several endowed and private organisations which provide a technical service to industry for the training of supervisors, in the form of organised technical and conference material, and which conduct foreman conferences (a service also offered under the Federal-State vocational education programme). There appears also to be a trend towards bringing training for supervisors within the framework of other plant training programmes, so that it is organised and carried out in far closer co-ordination with the training arrangements for non-supervisory productive workers.

The principal methods of training foremen have been classified as follows : the lecture method ; the conference method ; the on-the-job or direct contact method ; various combinations of these three methods ; and foreman news letters. The duration of training varies. The most successful company programmes are said to be those in which the training is organised as a continuous process, each course meeting particular requirements but fitted into a co-ordinated pattern of foreman development. The tendency is to pay foremen for time spent in training and to provide the training on company time so that all foremen can be reached. The training sessions generally last one or two hours and are held at weekly or semi-monthly intervals.

Supervisory training through the Federal-State vocational education programme is mentioned in Chapter II above, and the T.W.I. programmes for supervisory workers are described in Chapter V.

The subject has been summarised by the Training Director of the Eastman Kodak Company in the following terms :

> One of the purposes of management, or supervisory, training should be to develop within an organisation uniform interpretation and application of company policies and procedures. In some of the early attempts in undirected conference programmes, it became apparent that dissimilar conclusions were readily arrived at in the various groups. These differences occurred between plants and, within plants, between departments and between various levels of management.
>
> Another purpose of management or supervisory training should be to acquaint each individual member of management with his relationship with others which grows out of his responsibilities.
>
> Gradually, through trial and error, not through scientific manage-

ment, it became more and more apparent and recognised that management or supervision is a job, and that training should be based on analysis; further, that if it is to be effective it must be directed; finally, that if satisfactory results are to be obtained, training must start not at the bottom, but at the top. Every level of management from top executive to the direct supervisor must think alike on those things which are necessary to carry out the aims of the enterprise of which they are a part.

Such a programme can be carried on by a combination of instructing, lecturing and directed conference. If sound principles in economics, sociology, the natural sciences, or definite company policy are necessary to the solution of a problem under discussion, supply them by text or lecture. Then with the necessary known facts in mind let the group, through group thinking and discussion, apply them to a typical industrial problem in the field under discussion. With all the necessary information there will still be plenty of room for effective and sometimes even heated discussion of the problem. By this method time is not wasted in developing a fact, principle, or policy which has by experience or practice already been established. This method, however, will, through the give-and-take in the discussion, translate the necessary basic facts, principles or policies into each individual's thinking.

Over a period such discussions will develop uniformity of understanding, which is what we should be after. It will also lead to a very healthy habit of solving problems by principle rather than by precedent. In many cases, a problem may appear to be similar to a problem which the supervisor remembers, but the principles involved may be different.

Methods used have varied widely between companies. Some large concerns with several plants have held that if the management in a plant is to be held responsible for results, it must develop and carry on the necessary training. Others have held that to ensure uniformity necessary for over-all co-ordination, central direction is necessary. Many companies have felt that upper levels of management need no training and have confined their efforts to direct supervision. These attempts have led to difficulties because they failed to develop uniformity of ideas and understanding in the many levels of supervision between the direct supervisor and top supervision. Out of all of these attempts there has emerged a more generally accepted idea that training must start at the top and work down through all levels of supervision.

In a well-established organisation the discussions at the top level will be in general terms, and very often in the nature of pre-view sessions. As the programme progresses down the line of authority, the discussions should become more and more detailed to fit into the actual application of policy procedure or method at the point where work is done and the great mass of employee management contacts are made.[1]

Job instructor training is an important part of any company training programme. In most cases training activities for this purpose fall within the general framework of supervisory training.

[1] *Organisation of Training in Industry*, Topic XI, Conference at Cornell University's School of Industrial and Labor Relations (8 May 1948, mimeographed text).

Most job instructors are either supervisors or potential supervisors. The aim is to select those most likely to be able to help others to learn to do their work properly. Methods of job instruction vary, but the T.W.I. programme has had a distinct influence, and its method is now widely used in preparing the workers who are to act as job instructors.

The minimum recommended organisation for training job instructors is one or more trainers who do the actual training of instructors and an executive who can map out, co-ordinate and supervise the work. Some of the larger companies have members of their own staff qualified as instructor trainers and can thus train their own training staff and supervisors. In developing trainers, the practice is to select company employees of supervisory or executive grade, possessing the same qualifications as those instructing workers but with greater ability to learn and to teach. Where a company has its own instructor trainers, it has greater control over the training and especially over the follow-up. Where a company has no instructor trainers of its own, it has to rely on outside assistance, such as T.W.I., or the teacher training programme of the Federal-State vocational education authorities, or private industrial organisations or consultants.

The following steps have been suggested to industry as a guide in preparing the trainers who will instruct other workers how to do their jobs :

(1) Carefully select the persons who will be trainers, considering such factors as background, knowledge, reputation, ability to train, relations with people, sincerity, etc.

(2) Group those to be trained logically in terms of their experience, qualifications, abilities and plant responsibility.

(3) Help the instructor to understand the nature of the problem and objectives of the company training programme.

(4) Train those who will instruct in both the subject-matter and the techniques of training.

(5) Urge instructors to continue preparation before each training session, and to go on with practice of good job instruction methods.

(6) Give instructors an opportunity to get together to exchange experiences and to observe each other in action.

The cost of training job instructors varies from one company to another. Its main items are the wages and salaries of the men and women being trained to instruct other workers. Where outside services are enlisted to provide the training, their fees may add to the cost. The Federal and State vocational training agencies do not charge for their services.

Technicians

The training of qualified industrial engineers, professional and semi-professional workers and qualified technicians is somewhat outside the scope of this particular monograph. Nevertheless, attention may be called to the co-operative training schemes applied by a number of companies, under which selected students in, or seeking to enter, universities or higher technical training institutions are brought into the company's employment before the end of their technical studies and alternate periods of plant work and study until they reach the end of their formal study course, sometimes a matter of five years.

Apprentices and Learners

Plant apprenticeship schemes remain the basic method of training all-round skilled workers. These are organised, as a rule, along the lines set forth in Chapter III and in close co-operation with the workers of the plant.

One particular type of training may be singled out for mention here, namely, that often called learnership, since this type of training seems relevant to the practical needs of a number of European countries. Several companies have found a need for some type of training between apprenticeship and on-the-job training of unskilled production workers. As the National Industrial Conference Board put it : "A type of skilled worker is needed who will have greater versatility than the job specialist and can be trained in a shorter period of time than that required for apprenticeship." This type of training has a good deal of practical value in an emergency period, but has less to recommend it in normal times, since it may lead to inadvisable and unnecessary dilution of skill and an undercutting of established standards. This danger need not arise where learnership is organised in accordance with the provisions of collective agreements.

The so-called learnership programme is, in fact, a shorter period of intensive training which produces quickly specialists in part of a trade rather than experts in a whole trade or single-skill operators.[1]

[1] "Learners differ from apprentices in that their trade or occupation requires a smaller degree of skill and therefore a shorter period of training. Moreover, in the case of learners, there is no apprenticeship agreement to bind the worker and no corresponding responsibility on the part of the employer or the union to provide training." U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS: *Collective Bargaining Provisions, Apprentices and Learners* (Washington, 1947).

The standards for selection tend to be lower than those for apprenticeship, since the skill to be learned is less exacting. The age level of learners tends to be a good deal higher than that for apprentices. In general, learners are taught the phases of a trade that are most needed; for example, they are trained to operate two or three machines. Most of the training is directly on the job, under regular production conditions, and the trainees are assigned a good deal of productive work. Theory is kept down to a minimum. As a rule, a certain amount of related classroom instruction is provided, in which case the same techniques and methods are used as for apprenticeship. The length of the training varies with the operations being taught, from a few months to a year or more. Where collective agreements refer to learners, they usually fix the period of training and the wage rates.

By way of illustration, a milling machine company may be cited which has a learnership programme for the purpose of training specialist workers. New workers entering as learners, or employees assigned to or admitted to the learnership course, are sent at once to the department in which they will work after training. Their assignments cover some 18 different types of machine jobs, but they are thoroughly trained as specialists in only two or three. They remain in training for two or three years. During that period they are moved from operation to operation and usually get experience on five or six types of machines, including the two or three on which they are being trained as specialists. On each job, the trainee receives a detailed instruction sheet, describing the operations of the machine work required and including the blueprints for each step. The trainees work under the line supervisors, who devote a good deal of time to them. The progress of each trainee is checked by means of efficiency reports of spoilage and production rates. The trainees attend classes three nights a week, at which they study the courses or parts of the courses used by apprentices, *e.g.*, science, mathematics, blueprint reading, mechanical drawing.

A large motor company has a special learners' school, to which selected promising young workers other than apprentices are admitted. The learners are assigned to the type of work for which they seem best suited and then trained intensively, the group being divided into sections, such as tool and die (one month's experience in three types of work—sharper, mill, grinder or lathe), electrical repair (one month's bench work and two months' experience in repairing switches, ignition, starters, etc.), metallurgy,

machine repair, and automechanics. Throughout the period of learnership the emphasis is on productive work. The learners attend classes in the company's apprentice school for one hour a day twice a week.

An electric company has a progressive training programme, providing opportunities for those beyond the usual apprenticeship age, which corresponds fairly closely to learnership for specialists. Foremen are asked to recommend employees who appear capable of further training. Younger men with several years' experience with the company are preferred, particularly if they have had some vocational or technical school education. The applicants are interviewed and tested for intelligence, aptitude, mathematics, and mechanical ability. In the progressive training for metal trades, detailed lessons in terms of shop operations, based on actual production requirements rather than on what might be taught in the trade, are given the trainees by the instructors. The training is conducted on the job and the programme is progressive from stockroom work to tool-and-die making. About 90 per cent. of the trainees become machine specialists.

Training and Upgrading of Production Workers

The training of production workers to perform their jobs and to develop their ability as may be required by industrial conditions takes many different forms in United States industry. An effort has been made here to suggest those which seem to have some relevance to current training requirements in other countries rather than those which may be the most commonly practised at the present time by American companies. For example, the usual ways of training new workers tend to be systematised and intensified during an emergency, *e.g.*, when there is a shortage of skilled labour or a sudden and sustained expansion of plant operations. Skilled jobs may be broken down as much as possible into highly skilled and less skilled operations in an effort to reduce the number of highly skilled workers required and to increase the number of less skilled and specialised workers, thereby decreasing the training time for new workers. Training is speeded up in various ways and tends to become more efficient, if more narrow. Examples of such intensive training are appropriate here, even if at present this type of training is far less common in United States industry than it was a few years ago.

Immediately before the war, the National Industrial Conference Board carried out a study of training solutions for company prob-

lems, which reached the following conclusions in regard to trends in company policy for the training of non-supervisory production workers[1]: *(a)* closer co-ordination between educational institutions and industry, in the pattern of co-operative education ; *(b)* more effort to classify the elements that varied jobs have in common and to base training on these similarities ; *(c)* greater flexibility in the traditional system of apprenticeship ; *(d)* greater emphasis on the techniques of training through self-instruction by written reports ; *(e)* increased interest in training by line supervision using the technique of progression through a series of related jobs ; *(f)* increased tendency to include training ability as a qualification required of supervisors ; *(g)* effort to encourage creative thinking among production workers through consultative supervision ; *(h)* tendency towards company-wide programmes of training ; *(i)* greater emphasis on effective use of informational channels to give workers all relevant facts on plant operating conditions. To some extent, these conclusions have been outdated by war experience, but the principles implied in them appear to remain valid.

Wartime experience and present-day post-war practices in the training of production workers have not yet been analysed (so far as is known) in such manner as to permit a general survey of current programmes. However, it seems to be true that increasing numbers of companies are setting up some kind of systematic training for production workers and consider such training an essential feature of their training activities.

The decision as to where company training of production workers should be given depends on a number of factors—primarily, the type of work being learned, whether, for example, the training will disturb production processes, whether machines and other equipment can be set aside for training, whether the trainees can be used on production work and whether shop conditions are too distracting for good training. Moreover, in plants where there is a continuing need for additional workers, vestibule schools, set up in a separate part of the plant, are sometimes used for training ; whereas in most plants, where the problem is one of taking in smaller numbers of workers over a longer period, on-the-job training is apt to be used almost exclusively. In fact, on-the-job training is the customary way of training new workers both in normal times and in emergencies (it has been estimated that the vast

[1] Studies in Personnel Policy, No. 18, 1940.

majority of industrial workers receive their basic industrial training in this way; in wartime, it was estimated that 90 per cent or more of the war workers would be trained on the job).[1]

In plants without a planned training programme, on-the-job training can be little more than pick-up training — the trainee picking up what he can, mostly without help or supervision, about how the job to which he is assigned should be done. In other cases, however, there is a more systematic and formal job training programme, conducted by the working or non-working foremen. The training is conducted during working hours and in substantially the same conditions as those prevailing for the other workers, and, in most instances, directly on production work. The foreman may provide training and help himself, or a skilled worker may be assigned as a full-time or part-time job instructor. The quality of the training depends largely on the quality of the job instruction and supervision; hence the special stress now laid on the training of qualified supervisors able, among other things, to teach others. Where the initial training of production workers prior to their specific job assignment is given in groups (*e.g.*, through vestibule schools), a special training staff provides the instruction and supervision, in consultation with the production departments. This type of training is designed to give the new worker information useful in helping him to adjust himself to his new job and working conditions, as well as limited technical knowledge useful for job performance.

Many directors of training have urged that production workers' courses should grow out of a study of approved ways of performing the job or operation on the following lines:

(1) Break down the job or operation into component elements in much the same way as for motion study.

(2) Study each element from the standpoint of the exact method to be used, difficulties involved, safety, quality or other requirements, manipulative skill and direct and related knowledge required.

[1] The Eastman Kodak Company's Director of Training has urged that training should be done on the job: (1) when the job or task cycle is short and repetitive; (2) when it is impracticable to duplicate the necessary tools, machinery or equipment; and (3) when one or few new workers are added at a given time. Training should be started in a training department or pre-job assignment group: (1) when the numbers to be trained are too large to be handled by the potential job instructors; (2) when the nature of the work is such that the new worker cannot be placed on the job until he has been given training in the use of special tools, equipment, machines or methods, or because of accident hazards; and (3) when large numbers of workers are being hired for work in which basic skills can be given to groups of workers before job assignment (*e.g.*, single machine operations, and skills and tools involved in assembly work). (*Organisation of Training in Industry, op. cit.*)

(3) List the skills and knowledge required for each element (manipulative skill, practical job knowledge and related technical knowledge).

(4) Determine the order in which job skills should be developed and in which the worker should be instructed.

(5) Select the method to be used, together with the related training aids and materials.

On this basis, the plan of instruction is worked out. In some cases, the training for each major job or operation is written out in work sheets or a manual containing a statement of the duties of the job or operation and the recommended training method and period, and job assignment sheets (listing a specific job to do and how to do it). The job sheets are made to be consulted and used by the trainee on the job. They show, step by step, the operations of the job and give a concise yet detailed description (often with diagrams and illustrations) of how each step should be accomplished. The use of written job sheets has tended to reduce the time spent by supervisors on explanations and to permit the pace of the training to be adjusted to the individual trainee's ability to learn. One supervisor can assist and check the work of a series of trainees in different stages of training. Under the written training schedule, the trainee progresses from one job to another of greater difficulty, improving in speed as well as in quality, and his progress is continuously inspected and examined by his immediate supervisor. Naturally, some types of work require far closer supervision than others.

In some cases, training materials include photographs of key parts of the job operations (taken from the operator's eye level), illustrative diagrams or sketches, and sound-slide films and motion pictures. The training is also supplemented by classroom instruction given out of working hours in the company school or in the local vocational school.

During training, the trainee receives wages, which may increase during training. A record is usually kept of the training work which he has done. This helps in planning his training and placement or transfer in the plant.

In exceptional circumstances, as during the last war, in-plant upgrading training for production workers is organised in short intensive courses, either on the job or through specialised vestibule training, given for the most part during working hours. In more normal circumstances, as at the present time, some of the upgrading training of industrial workers takes place outside working hours (often in the evenings) and through classroom or classroom-

workshop training. A number of larger companies have their own schools which operate largely on an out-of-hours basis. In some cases, a group of smaller companies may combine to seek out and procure adequate facilities for supplementary instruction or training. As in the vocational schools, there is no set limit on the courses of these company schools; often it is stipulated that they should be related to the work of the company. Training is provided, for varying lengths of time, through classroom instruction and lectures, films, demonstrations, etc. In some cases, workers may be assigned to upgrading courses, usually through the supervisory machinery, and in others they may volunteer for them. Selection for upgrading training is based on a variety of factors (*e.g.*, merit rating by supervisors, length of service with the company, knowledge of trade or job and general intelligence); the aim of selection is to pick out workers able to profit from the training to be taken.

The in-plant training of production workers is free of charge to the worker or offered at a nominal charge, and in some cases various inducements are offered to persuade workers to start and continue vocational training as a part of their work career. As a rule, the training is confined to persons in the employment of the company or accepted for employment.

In a good many cases, the plant training programme makes some provision for drawing upon the vocational training facilities in the community.

General Organisation : Summary

Experience has shown that training of all kinds within industrial establishments is more successful where the management, the supervisors, the workers and the trade unions concerned not only accept the idea of training, but actually lend their full support and participate in the carrying out of the training programme. There has to be a voluntary realisation that the proper training at the proper time is of as much importance as the production methods and tools used.

Moreover, it has also been found that the responsibility for plant training must be clearly defined and specifically assigned. Companies have been urged to centre training responsibility in one department and in one man. Frequently, training is the responsibility of the personnel or industrial relations department of the plant. Sometimes, there is a separate department of training, rank-

ing, on the same footing, with any of the production departments. In many of the larger plants with extensive training programmes, there is a director of training, that is, the official responsible for organising, supervising and co-ordinating plant training activities. Under him there may be plant training supervisors or instructors. All these persons are full-time employees of the company (except that the services of certain outside instructor trainers or job instructors may be procured on a part-time basis). Sometimes training is a part of the production line organisation, with the aim of having it related more closely to the training requirements of the plant, but in such cases these training activities must be closely related to the staff organisation as well.

Conferences of training directors have been held for the exchange of experiences and views and also to help directors adapt their work to the needs of their own companies and to generally approved standards of company practice. In some parts of the country, professional associations of training directors have been formed.

One of the major responsibilities of the plant's training director or department is to estimate the training requirements of the establishment, in co-operation with the production departments, and to plan ways of meeting them through training programmes. As a rule, this involves fairly extensive use of job analyses, including time schedules, and in some cases time and motion studies are used to help to define job requirements. It also involves continuous collaboration with the employment service and other agencies of placement, with the technical and vocational schools and with other sources of labour supply.

The training director or department is also responsible for ensuring that all the various training activities of the company are fitted together into a cohesive pattern. This requires careful planning of the courses offered, closely related to the needs of the production departments, and co-operation with other agencies of training and retraining. Another important duty of the training director or department is to keep a continuous check on the quality of the training provided and of the work done by the trainees. The director or department serves as the real control agency of the application of training standards. Finally, the training director or department may be responsible for the instructor training activities of the company.

Within any department of the plant, the foreman is the person primarily responsible for the training programme as it applies or can apply to the workers of his department.

The co-operation of the workers of the plant in the organisation and operation of the training programme may be enlisted informally or formally. In some cases, a joint committee of management and workers' representatives advises the training department or director. Sometimes joint committees have responsibilities in helping to select trainees or checking on the training given. In many cases, no special committee is set up, but training questions arise in the work of other joint plant committees. Where the labour relations of the plant are the subject of a collective bargaining agreement, provisions in regard to training and the conditions of employment of trainees may be included in the agreement.

So far as the general organisation of training is concerned, few general comments can be made. The following are based on a limited analysis of company practices and on certain general sources of information (such as the National Industrial Conference Board and the American Management Association).

The *selection* of workers for admission to company training programmes has received a good deal of attention in recent years. At present, a relatively formal selection procedure appears to be an integral part of any large-scale training programme and to be taken into account in every programme. The aim of training selection policy is to reduce turnover in company training courses and to admit to training only those applicants who will be able to profit from the training. A steadily increasing number of companies seem to be using aptitude, intelligence and specialised trade tests for helping to select trainees, both for supervisory and for non-supervisory work. In some cases, physical examination is also a part of the selection procedure. Personal interview is usually the core of the process, but less so in respect of production workers than in respect of supervisors. The agent or agency of selection varies from company to company, though in all cases the management retains the right of final decision. This responsibility is usually exercised through the training department or the company officer charged with training. It should also be noted that almost invariably the worker's own interest in receiving the training is taken into account ; in many instances, employees of the company may volunteer for further training and are encouraged to do so. Finally, company experience has indicated the importance of employee understanding of the aims and methods of the selection process.

Methods of training vary with the company, the type of work being learned and the category of worker being served. It has been noted that group training of supervisors and direct on-the-job

training of production workers stand out as related post-war trends. In addition to the basic industrial philosophy of "learning by doing", lectures, conferences, discussion groups and question-and-answer periods with superiors, oral and written work in classes, and sound and silent motion pictures and other visual aids are used in training.

So far as possible, the practice is to make job content, as determined by job analysis and training time schedules, fix the *training content* of each programme and course.[1] The various courses are put into writing, and yet an essential characteristic of the programmes is their flexibility in conception and method ; the type of training and the methods are subordinate to meeting the needs for training. This appears to be true both in courses for supervisory staff and in those for production workers.

The *length of training* varies, of course, with the nature and type of work being learned and with the intensity of the course. To generalise, supervisory courses tend to be longer now than before the war, as do many non-supervisory courses for production workers. In times of shortage of trained manpower, however, both types of courses tend to be appreciably shorter.

The *remuneration* of persons in training under plant schemes is determined by the fact that in almost all company training programmes, the trainees are regarded as company employees and are on the company payroll. They are paid at fixed rates corresponding to their status and work experience in the company and the work being learned. For courses given outside working hours (most of the company schools are run on an out-of-hours basis), however, no extra remuneration is given to trainees as a rule ; the trainees attend on their own time and of their own free will. Usually, the company provides the equipment and all the necessary supplies, particularly of any costly items, and the tuition is either free or at a nominal charge.

Supervision of training is a responsibility of the company training department or official. In larger plants, the director of training may have training supervisors to assist him in controlling the

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[1] As has often been pointed out, for example in PERSONNEL RESEARCH FEDERATION : *Skilled Workers for Defense*, detailed job analysis is basic to personnel work in many United States industrial establishments and is used in employment work, testing, training and upgrading. With trained job analysis and the use of a plant manual, a uniform evaluation of all the jobs in the plant can be made. The analyses include basic information on job duties, job requirements in terms of working conditions, hazards and learning periods ; and on work requirements in terms of preferred age, experience, practical knowledge, vocational abilities and personal qualities.

quantity and quality of the training and in checking the progress of the individual trainees. In a good many cases, tests must be passed during or at the end of courses and in some cases a certificate is given to those successfully completing the courses.

In any company training programme, it has been found that results depend in large part on the effectiveness of the *instructors* who are training production workers on the job. Most of the training is carried out, as already noted, by working or non-working foremen and journeymen workers experienced in their trade and in the company, usually selected as instructors because of personal as well as technical qualifications which suggest that they will be able to give others the technical know-how and the work attitudes considered necessary for successful job performance. Also, as noted, a large part of the training of supervisory staff is aimed directly at making the supervisors good job instructors as well as good technicians and plant "housekeepers".

There seems to be greater interest in plant training activities than ever before. This interest is not confined to top management or supervisory staff but extends to production workers as well. The increased concern with training has arisen despite the abolition of many of the schemes which flourished during the war. A clearer idea of the purpose of plant vocational training appears to be emerging—purposes by no means limited to the individual plant.

The increased concern with training is not confined to large corporations or plants. Smaller plants are taking more responsibility for training and are seeking aid in developing training programmes adapted to their requirements. As one company's director of training has pointed out, smaller companies can enlist the help of outside agencies (public or private), but should not turn over all their training responsibilities to them. Their schemes must be related to their own objectives, just as in a larger organisation. A great deal can be done along community lines in aiding smaller business with training programmes. In Rochester, for instance, there is a community effort conducted through committees sponsored by the Industrial Management Council and also training programmes sponsored by industry and conducted by the Mechanics Institute. Several other communities have similar programmes.[1]

Moreover, it might be noted that in plants with extended training facilities there seems to be a tendency in company training policy to bring together all training activities within a common

[1] Cf. American Management Association, Personnel Series, No. 78: *Management Training for Foremen* (New York, 1944).

frame, and to link this co-ordinated programme more closely with the work of other agencies of training, on the one hand, and with the work of the production departments of the plant, on the other.

Finally, management's concern with in-plant training is being paralleled by trade union interest in the same field, and in many cases in-plant training schemes have the full support of the trade unions concerned and the unions participate, at the plant level, in carrying them out. This augurs well for the future, since management, as well as unions, recognise that little can be done in the field of plant training unless the scheme is supported by the workers.

On the whole, industry's experience of in-plant vocational training in the United States appears to be highly suggestive for industry in other countries. The training of workers by industry for industry, in co-operation with the trade unions concerned, has proved to yield tangible dividends for management in terms of production and morale and has also given millions of workers a chance to develop their technical skill and general knowledge.

B. Examples of Plant Training Schemes

Some examples of successfully operating plant training programmes are provided in the following section. Further information in regard to any of the schemes described or in regard to other training schemes in particular undertakings can be obtained through the International Labour Office.

Caterpillar Tractor Co.

One of the older and better known plant training programmes in the United States is that carried out in the Caterpillar Tractor Co., Peoria, Illinois, which manufactures road and farm machinery and other products, *e.g.*, tractors and wagons, motor-graders, bulldozers, scrapers, elevating and blade graders, terracers, Diesel and natural gas engines and Diesel electric sets. Manufacturing operations are centred in one large plant, which is equipped with a wide range of machine tools and electrically driven equipment. The plant has three major divisions : foundry, road machinery and tractor.

Training is organised with the full support of the management and has been made the direct responsibility of a special Training Department. The courses are conducted and supervised by a Director of Training, who is assisted by a staff of 40 training supervisors and instructors. The Training Department co-ordinates the

practical training in the shops and the classroom training of the hundreds of workers in training at any given moment. The classrooms are located in various parts of the factory itself and are equipped with related instruction materials of all kinds, including training films and a certain amount of shop equipment.

The training offered includes apprentice training for several trades, employee training courses, co-operative and graduate training courses, business training and supervisory training.

Apprentice Training

The apprentice courses for machinists, patternmakers (wood and metal) and foundrymen are open to high-school graduates, with aptitudes for the trades to which they seek admission. The courses, which last four years, are organised along the general lines described in Chapter III above.

Production Training Courses

There is also a two-year production training course in machine shop work, open to any worker employed by the company in any department (other than the Training Department) who has demonstrated his general qualification for admission to the course and who is between the ages of 20 and 32 years inclusive. In selecting trainees, careful consideration is given to school grades, admission tests (including mechanical and aptitude tests), length of service with the company and employment record.

The purpose of the course is to produce machinists able to operate any of the machine tools, such as lathes, drills, milling machines, grinders, planers and boring mills. Emphasis is placed on the adaptations of these machines to produce large quantities of identical machined parts.

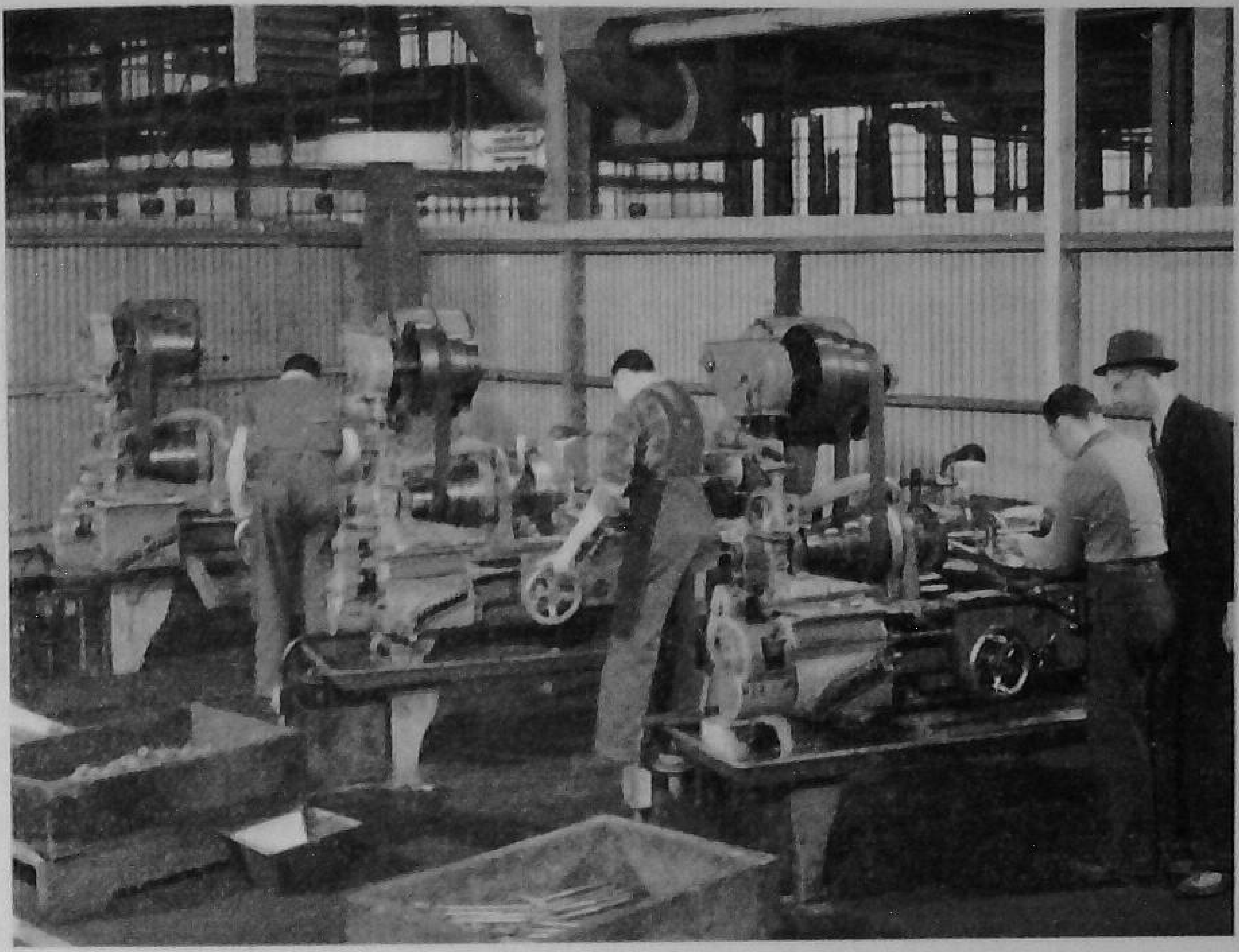
Each trainee selected by the Training Department signs, in duplicate, a training agreement which sets forth the conditions, duration and wage rates of the production training courses. The first six months are probationary: unsatisfactory trainees are dropped during this qualifying period. The first four weeks are spent on drills in the training shop and the trainee then moves to shops in the plant.

The shop schedule[1] is divided into four parts:

First six months:	Production drilling machines.
Second six months:	Production milling machines.
Third six months:	Engine and turret lathe work.
Fourth six months:	Varies with individual and shop needs, usually either planning, inspection, grinders, boring machines, broaching or special machining.

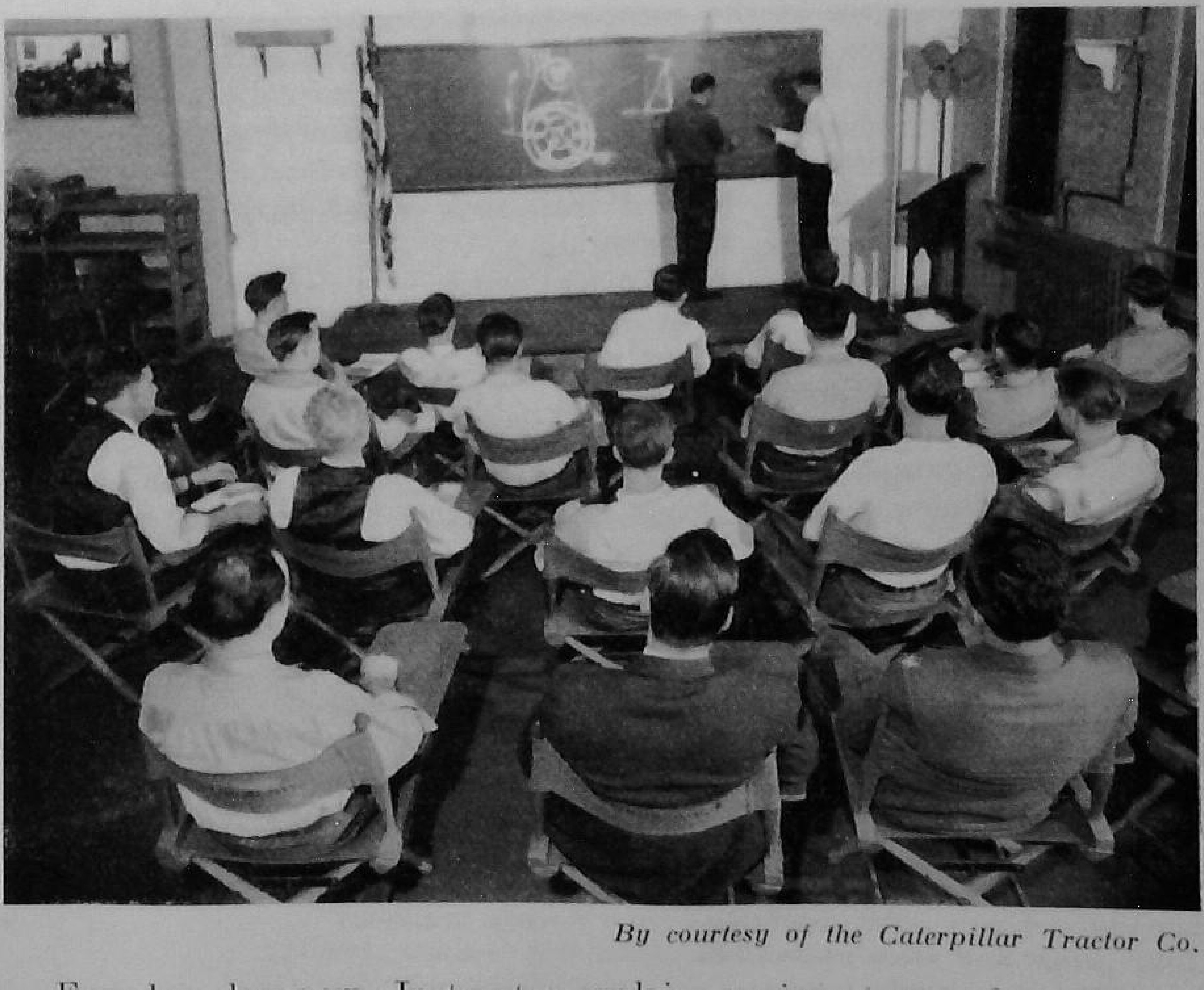
[1] The shop schedule is as follows:

	Weeks		Weeks
Elementary drills	8	Cutter grinders	8
Advanced drills	8	Cylindrical grinders	8
Handmilling machines	8	Elementary lathes	12
Power milling machines	12	Automatic lathes	12
		Turret lathes	16



By courtesy of the Caterpillar Tractor Co.

Engine lathes in training shop. Four-year machinist apprentices and production machinist trainees both receive instruction on these machines.



By courtesy of the Caterpillar Tractor Co.

Foundry classroom. Instructor explains various types of moulds.

Related classroom instruction is given regularly during the course, in weekly one-hour sessions at which there are lectures, discussions and motion pictures on various phases of the work. Moreover, such subjects as safety, shop practice and planning, industrial relations and economics are discussed. All classes are held in working hours. Each trainee studies related material furnished by the Training Department and is required to maintain a fixed schedule and high quality work. The subjects in the schedule include arithmetic, geometry, trigonometry, screw threads, pulley speeds and ratios, change gearing, grinding, mechanical drawing and sheet metal pattern drafting. Optional study materials include continued fractions, spur gearing, index and cam milling, strengh of materials and physics.

During training, the trainee's progress is controlled periodically and supervised by the staff of the Training Department. Tests are held at intervals to check achievement on particular phases of the work.

The trainees are paid by the company during training and remain in its employ in every respect. They receive fixed hourly wage rates, which are increased every six months. Training credit is given for each hour of overtime. Each trainee takes part in the " vacation with pay " plan, which amounts to a 4 per cent. increase in hourly rates, payable once a year.

Sheet Metal and Arc Welding Course

The sheet metal and arc welding course, also of two years' duration, is open to any worker in the company (outside the Training Department) with the requisite capacity and between the ages of 20 and 32 inclusive. Selection is based on the applicant's school records and special admission tests, length of service in the company and record of employment.

The trainee signs a training agreement setting forth the terms and conditions of the training course ; one copy is kept by the company and one by the trainee. The first six months of the course constitute a trial period for the trainee.

The training course is divided into two equal parts : first, sheet metal work, and secondly, arc welding.

The shop schedule for sheet metal work is arranged to make the trainee familiar with the general use of flat stock and structural shapes in the fabrication of the different products, and to develop skill at the necessary hand and power operations. The training work consists of bench work, soldering, spot welding, hand forming, operation of power tools on light gauge sheet metal, the nibbler, shear, punch and brake press. It includes press working of light and heavy sheet stock, die repairing, flame cutting, layout, and the power tools for cutting and shaping the heavy gauge sheet metal.

The shop schedule for arc welding[1] includes weld-cleaning, assemb-

[1] This shop schedule is as follows :

	Weeks
Training welding booth	2
Heavy structural steel frames	8
Heavy fabricated steel frames	8
Fabricated transmission case sub-assemblies (two 8-week stations)	16
Shears, brake press and punch press helper	8
Fabricated heavy steel assemblies (five 8-week stations)	40
Light gauge and steel assemblies	8
Substitute and utility welder	10

ling individual pieces and tack-welding into units, then welding. Experience is provided in light and heavy gauge work, on a variety of work most of which is welded by hand, and on the use of welding fixtures.

During training, regular weekly one-hour classroom sessions are held, during which lectures and discussions are conducted and motion pictures shown. Related subjects are discussed and classes held to explain and give individual help as needed. All these classes are held during working hours. The trainee studies related material provided by the company and is required to maintain a schedule and high grade of work. The subjects studied include mathematics, mechanical drawing, sheet metal pattern drafting, strength of materials, physics, elements of electricity, welding theory and welding metallurgy.

Wages are paid during training at fixed hourly rates, increasing every six months. Overtime hours are credited for training. The trainees participate in the " vacation with pay " plan.

Following successful completion of the trial period (during which tools and equipment are loaned), the trainee is sold a set of tools. Monthly pay deductions are made until the account is paid. On completing training, the trainee receives a cash refund for the entire amount paid for the tools and the tools remain his personal property.

Co-operative Training Courses

This is a five-year course for the outstanding apprentices. Persons admitted to the course take four months of work at the plant [1] and then four months of work at an Institute of Technology for a five-year period, receiving a bachelor's degree from the Institute and also completing their technical apprenticeship. All school expenses, tuition and room and personal expenses are paid by the student (the wage rates paid by the company while the trainee is at work being high enough to cover much of the school expense).

[1] The schedule is as follows :

	Weeks
Machine shop training :	
Drills	8
Milling machines	8
Hand-operated lathes	12
Semi-automatic lathes	8
Grinders	8
Foundry training :	
Moulding	4
Core making	6
Casting quality control and laboratory	1
Pattern shop	5
Heat treatment training	6
Welding training	6
Tractor assembly line and adjustment floor	8
Diesel engine assembly line and adjustment floor	8

Allis-Chalmers Manufacturing Company

The West Allis Works of the Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, a large firm which manufactures a great variety of machinery, has a special Training Department in its Industrial Relations Division. The Department was set up to encourage and provide additional training for the company's workers. It now offers 13 apprentice courses, 12 or more special employee upgrading courses, a graduate training course for engineers, and a course leading to a master of science degree in engineering.

Apprentice Training Courses

Apprentice training is offered young workers in the following trades: blacksmith, brass moulder, electrical mechanic, iron moulder, machinist, maintenance and production fitter, mechanical draughtsman, patternmaker, plate worker, sheet metal worker, toolmaker, and woodworker. Eleven of these courses last four years, and two (mechanical drafting and welding) last three years. Each apprentice is indentured with the State Industrial Commission and the company. The probation period (during which the contract may be annulled) is 520 hours. The training is conducted in the company shops, under skilled workers, and the related instruction is given in the vocational school. It follows the general lines indicated in Chapter III above.

The apprentice course for iron moulders, for example, lasts four years, during which the apprentice learns the best methods of sand control, core control, handling and reclamation and the use of hydraulic casting cleaning systems; he familiarises himself with every type of equipment and practice used in modern foundries. While working as a moulder's helper, he helps to sift sand and rams flasks. Later he learns core making (bench and floor types), and is given sand moulding for bench work, small moulds and medium floor work, and all types of moulding with dry sand-floor, pit, loam and brick moulding. Twice a month, special safety classes are held for all shop apprentices.

Special Training Courses

Special training courses are offered to workers interested in developing or increasing their knowledge in particular subjects. Some of these are given regularly, others when a sufficient number of workers are interested. They are provided free of charge (as a rule), outside the regular work hours, in conference rooms of the Training Department. Such courses are given regularly or fairly regularly in basic electricity, blueprint reading, mechanical drawing, precision instruments, shop mathematics, shop sketching, slide rule, language (Spanish), etc.

To illustrate the length and content of these courses, reference may be made to the basic electricity course, which is designed for workers without electrical background or training. It lasts 18 weeks

and presents training in regard to magnetism, static electricity, current electricity, electric cells, storage batteries, electro-magnetism, generators, alternating current, electric motors, electric meters, etc. The training is given through lectures and discussions, and descriptive training films are used.

The blueprint reading course meets once a week for ten one-hour sessions. Workbooks and materials are supplied by the Training Department; shop drawings, models drawn to scale and blackboard sketches

By courtesy of the Allis-Chalmers Manufacturing Company.

Plant workers attending a special training course given in a conference room of the Training Department.

are used. The trainees follow the following course outline: history and composition of blueprints; one-view drawings; developing and projecting views; dimensioning; invisible edges and surfaces; oblique surfaces and auxiliary views; cylindrical objects; sectional views; screws, threads, symbols, tolerances, finishes and finishmarks, and other standards; assembly drawings; and drawings pertaining to specific departments, including detail, assembly and installation drawings.

Special training courses are given to meet a particular demand or need. Recent examples are a course in coil taping, and a course for welders in work in the tank and plate shop. The latter course is given in the evenings for first and third shift workers and in the daytime for second shift workers. Training films are used. The instruction is given in the tank and plate shop itself, and the trainees are paid for whatever production welding they do.

Vocational School Courses

The plant's workers also make use of the vocational training provided through the local vocational schools. Courses include shop work, blueprint reading and mathematics, trade and industrial training in machine and electrical work. A five-year technical course for the training of industrial technicians is offered in the vocational schools.

Engineering Training

Engineering students at nearby universities may arrange to go to school and work in the shops during alternate months. A graduate training course for engineers (including students from the above co-operative course, who may receive advanced standing) is organised through the Training Department ; under it entering engineer graduates receive two years of shop, office and classroom work and thorough training in the different departments before assignment to a particular department.

Foremanship Training

The Training Department also has special conference and on-the-job contact programmes for supervisors. The main purpose of these courses is to help foremen in the duties of their job, especially in instructing new workers in the shops.

By courtesy of the Allis-Chalmers Manufacturing Company.

Classes for foremen are held to help them in instructing new employees in the shops.

Johnson and Johnson Company

The Johnson and Johnson Company, New Brunswick, New Jersey, which manufactures medical and sanitary supplies of many kinds, has a comprehensive training programme of long standing. One phase of the total programme is "operator training", the on-the-job instruction of new and transferred employees.

It is the purpose of this training to reduce labour turnover, increase quality production and promote high morale in the plant by aiding employees to adjust to their new jobs. It tends to cut learning time, so that the employee may get into production quickly, thus increasing his earnings.

The Training Department of the company has a fourfold responsibility with respect to this training, namely :

(1) to assist the department head in the formulation of standard operation sheets ;

(2) to assist the department head in the selection of suitable job instructors ;

(3) to ensure the best instruction by giving instructors an initial course in production training methods and by making subsequent observations to check on the quality of instruction ; and

(4) to regularise the department's production training activities by writing and establishing a standard practice for operator training.

The standard procedure for operator training, a sample operation sheet and the organisation of the Training Department are reproduced below.

Objectives

(1) To make available trained instructors for the various departments in order to instruct workers in the correct way of doing their job.

(2) To prepare employees as quickly as possible for production.

(3) To set consistent standards of training for all departments.

(4) To increase production by standardising the one best way.

Standard Procedure for Training of New Employees in the Plaster Finishing Department[1]

To facilitate and regularise the induction and training of new employees and persons transferred from outside the department, this description of current operator training practices has been prepared.

[1] A department staffed mainly by women.

Departures from this procedure must be made only with the approval of the foreman or his delegated representative. Such changes will be recorded and will become part of regular practice.

I. *Procedure for Induction*

New employees starting work in the Plaster Finishing Department are hired through the central employment office after they have been interviewed by the department foreman. Before going to work in the department or in the first two or three days of employment, the new employee is given general orientation to the company by the Training Department. Transferred employees do not receive this orientation. In any event, the following procedure is currently followed by the Plaster Finishing Department in inducting new and transferred employees :

A. *Interview with Foreman.*

The newly hired or transferred employee, upon arrival at Plaster Finishing, is interviewed by the foreman. The purpose of this interview may be twofold : (1) to determine correct job placement for the employee ; (2) to welcome the employee and establish early a sympathetic employee-employer relationship.

B. *Interview with Assistant Foreman.*

Employees are next introduced to and interviewed by the assistant foreman. The object of this interview is to further strengthen the relationship between the employee and management and to gain a complete initial knowledge of the employee's background.

C. *Orientation by Group Leader.*

After these initial interviews, the employee is introduced to her department group leader, who is responsible for orienting the new employee to the department. In the course of this interview the group leader must make certain that the employee has the following information :

(1) over-all picture of the product being manufactured ;
(2) general nature of the job she will be doing ;
(3) wages, hours, shifts ;
(4) departmental rules regarding absence, lateness, smoking ;
(5) payday ;
(6) location of lunch room, rest room, etc. ;
(7) location and use of time clock ;
(8) transportation facilities ;
(9) name of person who will instruct her ;
(10) names of fellow-workers with whom she will be closely associated.

This information may be presented (1) all at once in a planned interview, or (2) it may be presented intermittently and informally during the employee's first day or two on the job. The first, planned approach ensures complete coverage of essential information. The

second, more casual approach may avoid overloading or confusing the new employee. It should be recognised, however, that the unplanned approach is dangerous because it may lead to incomplete orientation or to none at all. It is the responsibility of the group leader to see that this orientation is effectively and fully accomplished by whatever method is best suited to the situation.

II. *Procedure for On-the-Job Production Training*

After induction by the foreman or assistant foreman and group leader, the new or transferred employee will be assigned immediately to an instructor for job training. Her training will be done by this person. Confusion will result from the switching of instructors or from permitting unauthorised persons to advise, direct and instruct the new employee. This training will substitute planned, carefully administered, and highly efficient procedure for the slow and costly, haphazard learning that will otherwise take place.

Training will continue until such time as it is evident that the new employee has mastered the job procedure. After this, the instructor will taper off instruction and supervision. However, some follow-up should continue until the new employee is able to make out on the job.

A. *Who will Be Trained ?*

On-the-job training is designed to accomplish two general objectives : (1) the job instruction of newly hired employees or of employees who have been transferred from other departments ; and (2) the job instruction of employees who have been transferred from another job within the department.

If it appears necessary and desirable, this training may be extended to include present operators who need correction or improvement in the jobs they are currently performing.

B. *Who will Do the Training ?*

Training will be done only by regular instructors selected from among the operators and group leaders in the department. This selection will be made by the group leaders and assistant foreman subject to the approval of the foreman.

(1) *Basis of selection.* Selection will be made on the basis of *(a)* job knowledge and skill, *(b)* willingness to impart information, *(c)* enthusiasm for quality workmanship, *(d)* ability to think and to express ideas clearly and logically, *(e)* ability to inspire confidence in others, *(f)* ability to understand and sympathise with the new worker's point of view, *(g)* ability to establish quickly a friendly relationship with others, *(h)* loyalty to the company and the department based on an understanding of the principles and objectives of both, and *(i)* ability to use the above knowledge and attitudes to help employees reach and maintain peak production with the least amount of discomfort to themselves or others.

(2) *Pay.* Instructors (with the exception of salaried supervisory personnel) will receive average earnings for time spent in training activities.

(3) *Duties and authorities of instructors.* Operators who are selected to be instructors remain under the direct supervision of the group

leader in the department. It is the duty of the group leader to supervise the instruction to see that the standard method is being taught, that quality standards are being met and that the instructor is using proper instructional techniques.

It is the duty of the instructor to *(a)* prepare job breakdowns subject to approval of group leader, *(b)* prepare necessary equipment and materials, *(c)* present the instruction according to established techniques, *(d)* observe the new employee's performance, and *(e)* check frequently to ensure maximum progress on the part of the new employee.

Instructors must give to the training job all time that is necessary to ensure satisfactory results as determined by established performance standards. On those occasions when a specific training assignment has been made, it must take precedence over production demands. However, instructors will carry out their training function only upon assignment by the group leader.

C. *Where will the Training Take Place ?*

Under present conditions, it is necessary and desirable to have all training done on the production line. There will be no pre-production or vestibule training. New employees will be trained at the machine or table where they will be working.

D. *How will the Training Be Done ?*

(1) *Training of instructors.* All instructors must receive training in teaching methods before they are given training assignments. If the training programme is to be effective, instruction must be uniform and in accordance with the principles of good teaching.

(2) *Steps in teaching.* Specifically, each instructor must follow the steps outlined below.

Step 1. *Break down the job.*

Develop an operations sheet for each job that she will be required to teach. These operations sheets are intended to serve as an outline or guide to the instructor in her training. They are a supplement to instruction, not a substitute for it. They will contain, *(a)* a detailed description of each step in the operation, *(b)* any key points that a new employee should be taught, *(c)* quality specifications for the operation in so far as they concern the employee, *(d)* safety factors, and *(e)* machine care instructions.

If it appears desirable, some elements of the operations sheets, such as safety factors and machine care instructions, may be duplicated in a handy form and given to the new employee as a permanent reference.

Step 2. *Prepare the workplace.*

An important phase of every job is the *housekeeping* that is involved. To establish first impressions that will assure good work habits on the part of all new employees, the instructor should present a constant example of neatness and order.

Machines should be properly cleaned and cared for before instruction.

Necessary equipment and material must be on hand and in the proper place. No unnecessary material, equipment, tote boxes, personal belongings, etc., must be kept at the workplace. New

employees must be trained in good housekeeping and must be convinced that neatness of person and workplace is an integral part of the job—one for which they are being paid. They should be told that time study rates include an allowance for housekeeping and machine maintenance.

Step 3. *Instruct the new employee.*

The new employee will be trained by her instructor in accordance with the following steps :

(*a*) *Prepare the worker.* Since learning takes place best and most quickly when the worker is not tense and frightened of the job and the new surroundings, the instructor will make every effort to put the learner at ease.

The instructor will endeavour to interest the learner in the job by showing its importance in relation to the finished product, the advantages of the job to the employee, possibilities for self-improvement, etc.

The instructor will discover, by observation and questioning, how much familiarity with the job the new employee has. Without this information, the instructor will not be able to adapt the instruction to the needs of the individual learners.

(*b*) *Present the operation.* It is essential that the instructor adhere closely to the recommended procedure in this step.

Working from the job breakdown and clearly developing one step at a time, the instructor will tell and show the new employee how to do the job, stressing key points, knacks, quality standards and safety precautions. This step will be repeated as the complexity of the operation indicates.

Next the instructor will perform the job while the learner tells her what to do in each step. Here the instructor will discover any points on which the learner is weak or confused and take care of them at once.

(*c*) *Have the worker perform.* When the instructor is sure that the learner has mastered the steps and key points, she will have the learner perform the job, stopping her only when a mistake is made.

Finally, the instructor will have the learner perform the job, explaining what she is doing and why. This step will be repeated until the instructor is sure that the new employee has mastered the details of the job.

(*d*) *Follow up the instruction.* Following this initial training, the instructor will make herself available to the learner at any time that questions arise and will *insist that the learner come to her and no one else for help.* In addition, the instructor will check with the learner at regular intervals (every 2 hours the first week and with decreasing frequency thereafter) until the learner is able to do the job effectively alone.

A major purpose of the follow-up is the maintenance of standard procedures. It is assumed that one best method has been determined for each job. It is this method that has been described in the operations sheet and has been taught to the new employees. Instructors must insist that this method be followed without deviation until such time as a change of method has been approved by the foreman and has been put

in writing to replace the original operations sheet. This rigid adherence to standard procedure is absolutely essential to the success of the training programme.

E. *What is the Function of Line Supervisors in this Operator Training Programme ?*

As stated earlier, the group leader is responsible for the supervision of instructors and the maintenance of high quality training. While she should not have to do much actual training, upon her supervision will depend the success of training in the department — whether it will be a strong, continuing programme or a flash-in-the-pan project that dies or disintegrates.

More specifically, the group leader has the following training responsibilities :

(1) *Supervision of instructors.* No training programme is any better than the people doing the training. The group leader must make certain that instructors are employing the prescribed teaching techniques and that they are teaching the jobs as described in the operations sheets. To facilitate the supervision of teaching techniques, a *check sheet for rating instruction* has been prepared and a copy is appended to this report. Each group leader should make at least a monthly observation of the instructors under her supervision and should indicate criticisms and suggestions for improvement on the prepared form. This observation should be followed by a private conference with each instructor, in which recommendations are discussed. The object of these observations and conferences should be to reinforce the instructional training already received.

In the event that group leaders are acting as job instructors, their performance should be observed by the assistant foreman, who may, in turn, find it desirable to make recommendations for the improvement of their instruction in accordance with accepted methods.

(2) *Assignment of training jobs to instructors.* The group leader must determine which instructor is best fitted to teach any particular job. She must assign to the selected instructor any new employee who is to be trained for this particular job. In addition, she must make certain that (barring absence from work of the instructor) no other person advises or instructs the same new employee in the same job. Duplication of teaching effort leads to confusion, overlapping, perhaps contradiction and certainly wasted time and money.

(3) *Supervision of quality standards.* The group leader, assisted by the quality control inspector, must ascertain that new employees are being taught the proper quality specifications and that their work measures up to those standards. It is the duty of the instructor to teach these standards, but ultimate responsibility for checking is the group leader's.

(4) *Technique of supervision.* Although the instructor normally would have no supervisory authority, while she is training a new employee she is, in effect, acting in a supervisory capacity. To assist her in carrying out her responsibilities and in maintaining the respect and compliance of the leader, the group leader should do nothing that will destroy this impression of authority. If the instructor is guilty of any errors in instruction or even of any overstepping of authority, the group leader should correct or reprimand the instructor privately and in such a fashion as to cause the instructor no loss of prestige or authority.

Instructors who are consistently guilty of the breaches cited above and who do not respond to corrective efforts should be replaced after they have been shown the justice of such action. Since the group leaders, assistant foreman, and foreman have made their original selection of instructors with care, such extreme action should seldom be necessary. Too frequent turnover among instructors will weaken and eventually destroy the training. It constitutes, moreover, a reflection on supervision, whose responsibility it is to make full use of each employee's ability.

F. *What is the Function of the Training Department in this Operator Training Programme ?*

It has been indicated above that primary responsibility for the maintenance of the operator training programme rests with supervisors in the Plaster Finishing Department. They must make a wise selection of instructors, must regulate the assignment of new employees to the proper instructors and must supervise to maintain high quality instruction in a continuing programme.

At the same time, the Training Department also has definite responsibilities relative to the operator training programme. *First*, it is the responsibility of this department to prepare the instructors for the training job for which they have been selected. When new instructors are selected, the Training Department should be called in to instruct them in teaching methods before they are given any training assignments.

Second, the Training Department will set up additional training for instructors upon request from the foreman. This training may be designed to meet new training problems that arise, or to improve and correct substandard performance of current instructors.

Third, the Training Department, in order to discharge its obligation to the management of the Plaster Finishing Department and to ensure high quality instruction, will make monthly inspections of instruction and will submit to the foreman and the Personnel Director all suggestions and criticism arising from this observation.

Fourth, the Training Department will conduct refresher courses in standard job instruction methods for all instructors at three- to six-month intervals. The object of these courses is to keep instructors aware of correct methods and to overcome the forgetting that may accompany limited use during any three-month period.

SAMPLE OPERATION SHEET FOR INSPECTING, CUTTING AND FINISHING MOLESKIN ADHESIVE (½ AND 1 YARD)

First Operation

A. *Cutting.*

(1) Wheel drum into place parallel to and about 2½ to 3 feet from the end of the cutting table. Drum must be faced so that the plaster is pulled off crinoline side up.

(2) Cover truck wheels, floor, and other exposed surfaces with paper so that the plaster will not be soiled if it drags. Brace wheels.

(3) Pull end of plaster over the middle roller at the end of the table, across cutting board, to appropriate marker on table edge (½ yard or 1 yard).

(4) Depress cutting knife fully to cut plaster at proper length.

(5) Stack cut adhesive aside and repeat previous steps until the drum roll is gone. Count pieces as they are cut.

B. *Inspecting.*

Before it is cut, the plaster must be examined for defects. When it is possible, such defective sections will be cut out with a minimum of waste.

Points to watch for in inspection are listed below :

(1) Splices : When possible, cut off just enough to remove the splice.

(2) Foreign matter : When there are particles of foreign matter in the mass or in the crinoline, the piece must be rejected.

(3) Calender stop marks.

(4) Blisters.

NOTE : Instruction in inspecting should be accompanied by a display of common defects.

Second Operation

A. *Dating.*

(1) Stamp crinoline with appropriate date. Explain purpose of dating, location of stamp, etc.

B. *Inserting Pull Tab.*

(1) Separate crinoline and plaster at one end of piece about 1 inch.

(2) Place pull tab evenly on plaster extending about 1/4 inch beyond end of plaster.

(3) Smooth down crinoline over pull tab.

(4) Stack piece aside.

C. *Rolling Moleskin and Placing in Tube.*

(1) Fold over end opposite pull tab. Make fold about 1/2 inch.

(2) Roll evenly and tightly, using palms of both hands.

(3) Insert roll in tube which is in packer.

(4) If roll extends above rim of tube, tap tube sharply on table to jar moleskin down.

D. *Capping Tube.*

(1) Place cap on tube. Cap all tubes in one packer.

(2) Set cap firmly by rapping with heel of right hand.

(3) Close top flaps on packer.

E. *Labelling Packer.*

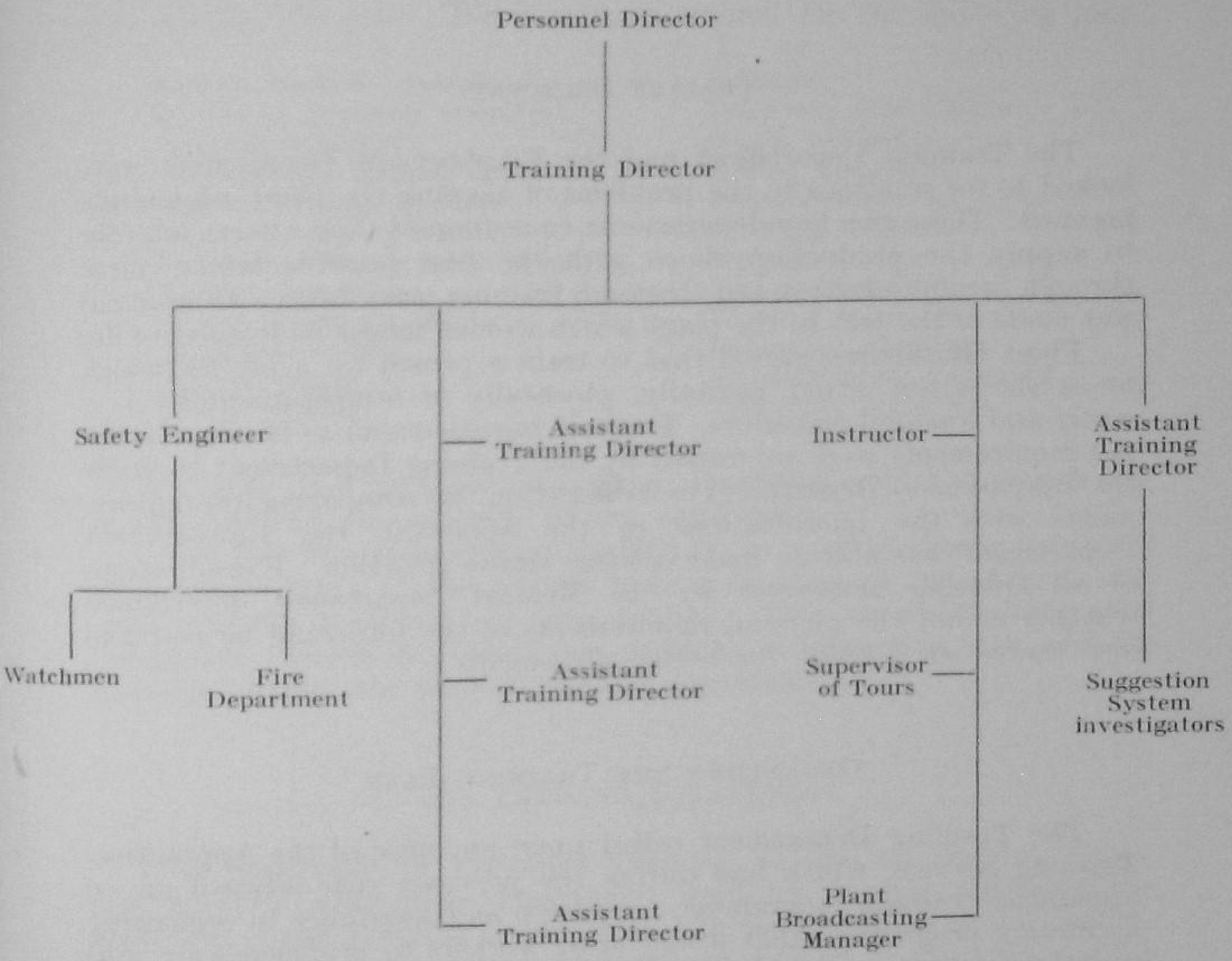
(1) Moisten label.

(2) Centre label on closed top of packer.

(3) Smooth down with damp cloth.

(4) Set packer aside.

Organisation of Training Department



Curtiss-Wright Corporation

The training plan adopted by an aircraft manufacturing concern, the Curtiss-Wright Corporation, Beaver, Pennsylvania, to overcome war manpower shortages at one of its plants is summarised here, since the plan is considered adaptable in many respects to post-war conditions.[1]

When the Beaver, Pennsylvania, plant of the Curtiss-Wright Corporation started operations, the manpower requirements of the armed forces were not known. The plant had welcomed young men of the community as workers. They were receptive to new processes in a new industry and they were physically strong enough to handle the large propeller blades in all processes of manufacture from welding through annealing, machining, final balance and inspection. The two

[1] From Technical Bulletin No. T-119, prepared by the Apprentice-Training Service, now the Bureau of Apprenticeship (Washington, 1944).

major problems company officials faced were : (1) what suitable applicants could be found to replace these young men ; and (2) how could inexperienced persons be trained quickly to perform the jobs requiring specialised skills ?

Trainee Selection

The Training Department and the Employment Department were looked to for solutions to the problems of keeping the plant adequately manned. These two key departments co-ordinated their efforts in order to supply the production shops with the best possible labour force through careful selection and thorough training procedures. An analysis was made of the jobs in the plant which women might be trained to do.

Plant officials recognised that to train a person for a job for which he or she is not fitted mentally, physically or temperamentally is a costly and wasteful procedure. To avoid misplacement as far as possible, job requirements were submitted by the Training Department to guide the Employment Department in its selection. By comparing job requirements with the qualifications of the applicant, the Employment Department was able to make a more astute selection. Examinations of all entering employees by the Medical Department determined whether or not the physical requirements of the job could be met and also served as a guide for better placement.

Organising the Training Plan

The Training Department called upon an office of the Apprentice-Training Service, which had during the previous year advised on an apprentice training programme, for advice and assistance in organising a training programme that would bring workers to proficiency on jobs requiring varying degrees of skill. The training plan which resulted provides induction, pre-production (in-school), on-the-job, job instructor and apprenticeship training.

Under this plan an employee hired as a learner is assigned to the Training Department but is trained in a production shop on the job for which he or she has been employed. By assigning the beginner to the Training Department, production department officials do not have to worry about what green workers will do to production records, nor are they harassed by having to think of training as well as production problems. A learner is transferred to the production department only when the production foreman and the assistant supervisor of training agree that this worker is ready for production tryout. Success of the plan is attributed to the close co-ordination of Training Department operations with the Employment Department and the production department foremen, and to the clearly defined responsibilities within the Training Department for initiating and following through to completion the training of each beginner.

Worker requirements of production departments are met through the continous training of inexperienced workers and the upgrading of those in the plant to take the place of withdrawals for military service and other factors affecting turnover. To maintain its force of 3,200 persons, approximately 4,500 were recorded by the Training Department as having received training, or initial upgrading, during 1943. This

contrast in the number of persons reflects to some extent the turnover due to military withdrawals and other causes, but the more significant factor is that, by following a policy of upgrading training for workers in the plant whenever possible, some workers were trained for several jobs during the year. Workers were trained for the following jobs:

Milling machine operator.
Hydraulic pressing operator.
Grinding operator.
Swaging and forging operator.
Copper brazing operator.
Heat treating operator.
Turret and finish lathe operator.
Hobbing operator.
Atomic-hydrogen welder.
Acetylene welder.
Chrome plater.
Cutter grinder.
Balancer.
Trimmer, shot blaster.
Bench worker.
Milling inspector.
Pressing inspector.
Grinding inspector.
Forge inspector.
Lather inspector.
Welding inspector.
Balancing inspector.
Bench reading inspector.
Trimming inspector.

Training time for these jobs varies, depending upon the complexity of the job and the aptitude of the employee.

Over 600 women have been trained to do most of these production shop jobs. Many of the women have gone through the arduous six-week training in atomic-hydrogen welding. They are maintaining good production records in welding, are excelling in inspection jobs, and are learning quickly the various machine operations.

The Training Department

The Supervisor of Personnel Training advises on training policy and consults with other department heads on matters affecting the activities of the Training Department. In the operation of the department, he is assisted by three assistant supervisors of training, one for each shift, and by job instructors in all departments in which learners are placed. Assistant supervisors of training are responsible for job instructor training and for review of recommendations on the fitness of a learner for the job and for advancement from trainee to production worker status. Job instructors train learners in actual job performance, keeping daily records of progress.

Induction Training

All new employees are introduced to company policy and practice through explanatory talks by the Safety Director, the Captain of the guard force, and the Director of Employee Activities. An assistant supervisor of training welcomes the learners, exhibits photographs of the manufacturing operations, outlines the plant organisation and training procedures. This informational and morale building session is further emphasised through booklets given to each employee for future reference.

Women employees are met by the Woman Counsellor. She welcomes them to the plant, tells them of the services her office provides, and invites them to consult on any adjustment problems entering the new work. She guides them through the induction training described above.

Pre-Production Training

In training for inspection, template making and other jobs in which class instruction is advisable before job practice is undertaken, classes are conducted at the Midland High School under the auspices of the State vocational school system. Job practice is closely co-ordinated with theory. For instance, actual practice in inspection is given, as the learner is instructed in the use and care of inspection tools and the theory of inspection. By the time the course is completed, the learner will have performed about 5,000 actual inspections on various parts, using all of the instruments under the supervision of trained inspectors. Work instructors are from Curtiss-Wright.

Training on the Job

A basic principle of the training programme is that " the employee earns his job through learning ". Training on the job is given by a full-time job instructor to all workers being introduced to an unfamiliar job in a production department. This same procedure is followed for newly hired workers, trainees who have had pre-production training and upgraded workers. During the first two weeks, the worker is trained in the basic elements of job performance. General attitude is carefully observed and a record of progress is kept by the instructor. If there is evidence of improper placement or lack of aptitude, the learner is referred to the Employment Department for transfer to a more suitable job or for dismissal. Training for the job rather than production is stressed during the first 24 days while all learners are on the Training Department payroll.

When the basic job steps are mastered, a trainee proceeds to production work. Results and work method are checked frequently by the instructor. During the entire training period, emphasis is given to quality of work, safety practices of the job, care of materials and tools, the relation of the job to others within the department, and of each job to the final product.

On the 25th day of employment, the assistant supervisor of training for the shift examines the learner on his or her knowledge of the job. The learner's production and attitude record is reviewed by the assistant supervisor of training with the departmental foreman. If the record is favourable and the learner has passed the examination, he or she is transferred to the production department payroll from the Training Department payroll. After transfer to a production department, the quality of the work done is checked periodically by the instructor and further instruction is given where needed.

The training procedures and rate of pay are the same for men and women trainees. A learner does not participate in the group incentive bonus until he is transferred to a production department, but he may receive a shift bonus.

Welder Training

Welding department training follows the on-the-job training principles but has special features to meet the exacting requirements of work in this department. While the beginners are becoming acquainted

with tools and are practising their use, they are also becoming acclimatised to working near heat. Practice tables are placed near heated jigs so that the beginner feels some heat radiation but not as much as is experienced when actually on production work. There is no emphasis on production volume, but detailed records are kept of progress in techniques and of adjustment to the shop. Through this introductory training, much of the difficulty in becoming accustomed to the working conditions and the discouragement in mastering welding techniques are overcome. After a period at the practice table, most beginners are well acclimatised and have mastered the fundamentals of atomic-hydrogen welding sufficiently to be transferred to production work. This type of welding has more exacting requirements for production work than the tack-welding used in some other war industries. In the production shop the jigs are covered with asbestos to keep the heat from rising towards the welder, and an adjustment for air cooling keeps jigs and blades at a proper temperature. Heat-resistant and flame-proof jackets of lightweight material are supplied to the welders.

Beginners who pass the test on elementary instruction, given after the first period, are started on production work on the heated jigs. Performance during the first five days on production is recorded in detail so that work aptitude can be quickly judged early in the training period. Production tryout training continues under the close supervision of the job instructor for the remainder of the eight-week training period. The responsibility of training as an atomic-hydrogen welder in the manufacture of hollow steel blades is pointed out to the beginners. Operating regulations of the welding department are set forth in a manual supplied to each welding " student ". Provision is made for a complete record of progress, accomplishments and failures. On the basis of the complete record of progress, approved by the assistant supervisor of training and reviewed with the foreman of the production department, the student is accepted or rejected as a full production worker. This acceptance does not mean that the worker is considered fully trained, but rather that he or she receives the salary, seniority and status of a production worker. The training is continued through follow-up checks by the job instructor on quality and quantity of work. To reach full proficiency as an atomic-hydrogen welder, ten to twelve months of work practice is usually required.

Introducing Women Workers to Production Shops

In introducing women workers to jobs customarily performed by men, special attention was given to the selection of the first woman to be trained. There were no women employed on production jobs prior to 30 July 1942, when the first woman was hired as an atomic-hydrogen welding trainee.

Maintenance of a full force in the atomic-hydrogen welding department was the most difficult problem faced by the Employment Department. Training was difficult for the beginner and costly for the company. Working conditions were not entirely favourable as the work had to be done over heated steel blades. However, an adequate force of trained welders in this key department was essential to the flow of production and the quality of the product.

The necessity for recruiting women for this job was discussed with representatives of the United Steelworkers of America, and it was agreed that a woman should be selected for training as an experiment.

The first woman selected, in addition to other desirable qualities, had had experience in pottery work and was, therefore, used to working over heat. She was eager to learn welding and wanted to show that she could do it. Given the same training as the men, she completed it in a very short period of time, and is still on the job with an excellent production record.

When it was proved that women could do this work, the Employment Office hired as many suitable applicants as were available. There is now a good percentage of women in this department. Experience has indicated that women between the ages of 19 and 30 are best able to withstand continuous exposure to the heat. Difficulty in adjusting to the working conditions and discouragement in mastering welding technique cause a high turnover of beginners in this department, but through a carefully worked out introductory training schedule this is kept at a minimum. . . . In introducing women to various departments, the results of each innovation are carefully checked. In reporting on the work of a newly inducted group of women to the bench-reading inspection, it was noted that ability in reading is affected by the size and strength of the worker.

Training schedules are exactly the same for men and women trainees. However, adaptation of instruction for women workers is stressed. It is pointed out to job instructors that more detailed explanations will help to make up for lack of mechanical experience, that explanations of how and why will satisfy curiosity about the job and create interest in it, that comparisons with familiar work will ease nervousness and that encouragement will build self-confidence.

Plant Helps for Women Workers

A Woman Personnel Adviser acts as counsellor, helping the women workers with problems of adjustment to factory work and assisting those who are new in the community in getting settled and acquainted. She befriends the beginners during their first hour of employment and sees them through the induction training to their production department. Thus they know from the first day that there is a person to whom they can go for consultation. In addition to her personalised service to women workers, the Woman Personnel Adviser works with other supervisors in seeing that all facilities which contribute to the health and contentment of the women workers are provided. She consults with the nurses in charge of the completely equipped first-aid department on health and safety problems of the women workers.

Cafeteria service and lunch arrangements are such that workers can get a regular hot lunch during their lunch period. Locker and wash room facilities are new and roomy.

Job Instructor Training

Job instructors are trained in accordance with the basic principles of the job instructor training course of the Training Within Industry Service. These principles, supplemented by outlines of job instructor responsibilities and sample forms, are set forth in a manual prepared by the Training Department, entitled *Job Instructors' Training Procedures.* In this manual the training supervisor points out why training every learner is vital. The importance of attention to problems of production,

quality, safety, cost and personnel is stressed. The job instructor's tools are a job breakdown sheet, a timetable and the learner's daily progress record. Instructors analyse each job to be taught, listing the principal steps on a breakdown sheet (see sample sheet, below). They also make out a timetable form indicating the steps of the job to be taught and the time in which it is expected each step will be learned. On this form they also record the actual date of satisfactory performance by each learner on the various job steps. A progress record form for each learner is completed daily and sent to the Training Department for posting on the master training record card.

Training Record

A training record card is maintained in the Training Department for each learner from the first day of employment until he or she is transferred to a production department payroll. One side of this card contains personal history information, placement analysis, date reporting for work, shift number, name of job instructor, transfer information if any, date recommended for production, percentage of efficiency at this time, date accepted for production, percentage of efficiency required and present percentage of efficiency. On the reverse side of the card, daily percentage of efficiency is recorded, the earned number of minutes in training, and the efficiency expected at that date. Lateness or absence is also recorded on this form.

Apprentice Training

Men of all-round skill are essential in the machine shop at the Beaver plant. Only a few months after the new plant started operation, a programme for training machinist apprentices was inaugurated. This is a four-year programme in which young men acquire the skills of a journeyman machinist.

A written agreement signed by the company and the apprentice sets forth a definite schedule of work processes, the time to be spent on each, a progressive wage scale and a related instruction programme, totalling 576 hours in subjects related to the trade. The Training Supervisor acts as supervisor of apprentices. Records are kept of the progress of each apprentice and periodical examinations are given. Upon satisfactory completion of the requirements outlined in the agreement, a certificate of completion of apprenticeship is issued.

A joint committee, composed of three representatives of the company and three representatives of the union, meets periodically to discuss such matters as eligibility of candidates for apprenticeship, credits on apprenticeship in view of previous experience or education, ratio of apprentices to journeymen, working conditions, related instruction programme and progress of apprentices.

The apprenticeship programme was worked out by the Training Supervisor in co-operation with local representatives of the United Steelworkers of America. A representative of the Pittsburgh office of the Apprentice-Training Service acted as consultant. Related instruction classes are conducted at the Midland High School under the State vocational school system. This programme is registered with the Pennsylvania Apprenticeship Council.

SAMPLE JOB BREAKDOWN SHEET FOR TRAINING

Part : Turret lathe *Operation :* Loading

Important Steps in the Operation	*"Key Points"* knacks, hazards, "feel", timing, special information
1. Place blade in cradle.	Camber side up. Use gauge.
2. Position 42″ clamp.	Tighten with fingers.
3. Tighten chuck screws.	
4. Set centre line.	Use gauge.
5. Tighten clamp.	Must be firm.
6. Lower cradle.	
7. Position indicator.	At cuff ring.
8. Centre up hub.	Lead to trail edge camber to face.
9. Check throw and adjust.	Indicator at end of hub. Camber to face at 42″ adjustment.
10. Recentre at cuff ring.	
11. Check face and edge for throw.	
12. Position 24 Sta. clamps.	Indicator at end of hub.
13. Recheck balance throws.	

Scovill Manufacturing Company

In the Scovill Manufacturing Company, Waterbury, Connecticut, whose operations include varied types of machine shop work, the general training course in two sections — the rivetmaker section and the machine-tool specialist section — are described below.

General Training Course : Rivetmaker Section

Training Agreement

This Agreement, entered into this . . . . day of . . . . . . 19. .
between Scovill Manufacturing Company hereinafter referred to as the employer and . . . .
(name of trainee)
born . . . . hereinafter referred to as
(date of birth)
trainee and (if a minor) . . . . hereinafter referred to as parent guardian

Witnesseth that the employer, the trainee and his parent (or guardian) are desirous of entering into an agreement of training, and therefore, in consideration of the premises and of the mutual covenants herein contained, they do hereby mutually covenant and agree as follows :

The employer agrees to employ the trainee for the purpose of enabling said trainee to learn and acquire the trade, craft, or business of .... upon the terms and conditions contained in the schedule marked A contained in this agreement and made a part hereof.

The trainee agrees to perform diligently and faithfully to the satisfaction of his employer the work of said trade, craft or business during the period of training, complying with the training standards contained in the said schedule A.

The parent (or guardian) covenants with the employer that the trainee will duly perform all obligations undertaken herein.

The training term begins on the .... day of .... 19 ... and terminates upon completion by the trainee of .... hours of employment in said trade, craft or business as stipulated in the said schedule. The first 1,000 hours of this training shall be a probationary period, during which this agreement may be cancelled by either party by notifying the other party.

In witness whereof the parties hereunto set their hands and seals :

.... (seal) (trainee)		.... (seal) (employer)
.... (address)	by	.... (seal) (an authorised representative of the company)

Schedule A : Standards of Selection and Training [1]

1. *Definition of Trainee*

" Trainee " shall mean an individual employed by the employer to work at and learn a specific trade under the standards and conditions herein set forth.

2. *Qualifications for Applicants for the General Training Course (Rivetmaker Section)*

(a) Openings in the general training course (rivetmaker section) are available to applicants between the ages of 21 and 25 at the time of placement in the course.

With the approval of the General Training Committee, exceptions to the maximum age limits may be made for those applicants possessing unusual qualifications, or those whose opportunity to qualify for or to accept training was prevented by military service, provided all other requirements for admission to the course have been met.

[1] As revised on 5 December 1947.

(b) It is preferred that applicants be high school graduates or produce evidence of equivalent education.

(c) Applicants must possess the physical fitness, specialised interest and industrious habits necessary to achieve skill in a mechanical trade or craft.

(d) Applicants must satisfactorily qualify on either the excellent or preferred scales of a series of general reasoning and mechanical aptitude tests which are given by the Employment Department of the employer.

(e) Applicants must be approved by the Selection Subcommittee of the General Training Committee.

(f) Applicants must be American citizens.

3. *Continuity of Employment*

The employer intends and expects to give the trainee steady employment. He reserves the right to suspend trainees either wholly or in part whenever business conditions make it necessary. If a trainee is suspended because of business conditions he will be offered reinstatement before any additional trainees are employed.

4. *Dismissal for Cause*

Trainees are subject to the rules of the employer in the same manner as other employees and are subject to dismissal at any time for violation of such rules, or for failure to maintain satisfactory standards of performance.

5. *Supervision of Trainees*

The General Training Committee shall act for the employer in the operation and supervision of all training courses provided by the employer.

Trainees shall be under the general supervision of the General Training Committee, and under the direct supervision of the department head through the department foreman to whom they are assigned.

The Executive Secretary of the General Training Committee will be responsible for scheduling trainees from one department to another in conformity with the basic work schedule. He shall also see that trainees are adequately followed up and shall maintain a record of each trainee showing work experience, related instruction, and general progress.

6. *Standard Period*

The standard training unit of the general training course is the standard period.

A standard period consists of 2,000 hours of credited work or related instruction.

7. *Term of Training*

(a) The term of training for the general training course (rivet-maker section) shall be 4,000 hours of credited work, including related instruction.

(b) The term shall be divided into two standard periods.

8. *Basic Work Schedule*

Within the limitations imposed by the flow of work in the plant, the aptitude of the trainee and the time factors involved, as wide a variety of job experience as possible will be provided by the employer for the trainee, in the basic branches of the trades which are listed in this schedule. It is understood that the sequence of job experiences and the time to be spent in each branch are indicated as a guide and need not be strictly followed. However, any substantial variation from this schedule shall be subject to review by the General Training Committee.

Rivetmaker Course

Instruction in the rivetmaker course is provided in the general training room at the main plant and the rivet die tool room, hardening room and header departments of the Waterville division. In the general training room instruction is provided under specialist journeymen instructors, specifically on lathe work. At the Waterville division all instruction is carried on under the direct supervision of the foremen or experienced mechanics and rivetmakers. It is the purpose of the company to provide as wide a variety of work as possible as permitted by the aptitude of the trainee and the limits of the time schedule. The trainee is developed to the point where he may be permitted to work without direct supervision during the final months of training.

Lathe work: 500 hours.

This period of training involves instruction in the general training room under specialist journeymen instructors and covers the basic principles involved in the operation of lathes.

Rivet die tool room: 500 hours.

During this period of instruction, under the supervision of the foremen or qualified journeymen, the trainee is instructed in drilling dies, making punches and reamers, and in the operation of lathes, milling machines, drill presses and hydraulic presses.

Hardening: 160 hours.

This instruction is carried on under the direction of the foreman of the tool room and covers the basic principles of tool hardening within the limits required by rivet die makers.

Layout: 160 hours.

This phase of instruction includes the lining up, the sequence of operations and of jobs and the actual layout of jobs within the limits required by rivetmakers.

Header batteries: 2,380 hours.

During this period of training the trainee works on various types of headers. He is instructed in the methods of taking out and replacing tools, making machine adjustments, and touching up, polishing and otherwise preparing tools for the machines, in grinding cutters and

any other operations necessary to the setting up of headers and adjustment of tools.

Related instructions : 300 hours.

Total rivetmaker training : 4,000 hours.

9. *Related Instruction*

(a) All trainees will be required to attend classes in related instruction at the time and place to be designated by the General Training Committee for a minimum of 150 hours each year of training. The period shall be determined by the foremen of the rooms to which the trainees are assigned, in co-operation with the Executive Secretary of the General Training Committee.

(b) Trainees shall be paid their regular rate of pay for all time spent attending classes in related instruction.

(c) Within the limitations imposed by available facilities, it is intended that related instruction shall include subjects in the following list which are applicable to the section of the general training course to which the trainee is assigned :

shop mathematics ;
blueprint reading and sketching ;
slide rule ;
shop theory ;
heat treatment theory ;
machine and tool design ;
metallurgy of steel and other tool alloys ;
shop economics ;
safety ;
mills practice ;
manufacturing practice ;
other subjects to be agreed upon.

(d) If a trainee is laid off temporarily and during the lay-off period regularly attends classes in related technical instruction, as specified herein, he shall receive credit for the hours spent in such instruction towards his training, provided he has secured the prior approval of the General Training Committee, and provided further that the instruction be secured at an approved public high school or trade school. However, he shall not be entitled to any compensation for hours spent in attendance at such classes during a lay-off period.

10. *Periodic Examinations*

At any time that it may be determined necessary, the General Training Committee, through its Executive Secretary, may examine any trainee to determine whether satisfactory progress has been made. If the trainee is failing to fulfil his obligation and his progress is found to be unsatisfactory, the trainee may be permitted to continue his training on a probationary status ; or be required to repeat certain periods of the course ; or his agreement may be terminated for failure to maintain satisfactory standards of performance.

11. *Hours of Work*

It is understood that assignments of working schedules for trainees shall not conflict with any labour laws.

Trainees in the rivetmaker section of the general training course usually follow the operating schedule of the departments to which they are assigned.

Members of the general training course are required to work on all shifts as required and as assigned.

12. *Hours Credited to Training*

Training credit shall be given for *all hours* worked.

In case a trainee is required to work overtime, he shall receive training credit for only the actual hours of work.

A minimum of 2,000 hours of work must be satisfactorily completed before a subsequent standard period of 2,000 hours may be started.

13. *Probationary Period*

The first 1,000 hours of training shall be considered a probationary period. However, any member of the general training course who fails to maintain required standards of performance, who fails to adhere to the rules of the employer, or who otherwise indicates his inability to meet the requirements of the course, may be released at any time during the probationary period.

14. *Pay Schedule*

(a) 1st standard period (2,000 hours) : 96 cents.
2nd standard period (2,001 to 4,000 hours) : 99 cents.

These rates are effective as of 12 May 1947, and are subject to any subsequent revisions.

(b) Rate upon completion of training to be minimum hourly rate of labour grade 5.

This rate is effective as of 19 May 1947, and is subject to any subsequent revisions.

Members of the general training course shall be subject to the same conditions regarding overtime pay and shift bonus as other hourly-paid employees of the company.

15. *Training Agreement*

Each trainee who is accepted for training, together with his parent or guardian if he is a minor, shall execute, in duplicate, the training agreement included herein, which is a part of these standards. It must be signed by a representative of the employer. All parties to the training agreement shall receive a copy of the standards. Copies shall be distributed as follows : *(a)* one copy to the trainee ; *(b)* one copy to the employer ; *(c)* one copy to the guardian (if the trainee is a minor).

16. *Adjustment of Differences*

Trainees are encouraged to take up all individual suggestions or grievances through regular channels as indicated by the " challenge

system " of the employer. They should be directed, in order, through the foreman, the department head, and the General Training Committee, to the Director of Employee Relations, but need not be carried all the way if a satisfactory adjustment can be reached at any level.

17. *Special Note*

The employer reserves the right to train as many trainees as he deems necessary for his indicated needs, as long as suitable training facilities are available and there is a reasonable expectancy of placing all who satisfactorily complete the general training course.

18. *Completion of Training*

For satisfactory completion of the general training course (rivet-maker section) the trainee shall receive :

(1) a certificate from the employer to that effect, indicating the specific occupation in which he has been trained ;

(2) a set of tools with a minimum value of $25 ;

(3) a cash bonus of $100 ;

(4) if available, a placement with the employer in the occupation for which he has been trained.

19. *Modification*

The standards of selection and training may be modified by the employer at any time, but will not be so modified as to cause the dismissal of any trainee who may be covered by a training agreement at the time of modification, for failure to meet the modified standards.

General Training Course : Machine-Tool Specialist Section [1]

Purpose

To train properly qualified and accepted applicants as machine-tool specialists.

Examples of occupations for which training is provided : lathe operator, milling machine operator, shaper operator, bench work, die sinking machine operator, boring mill operator, grinder, etc.

Qualifications

Openings in the machine-tool specialist section are available to male applicants, 21 years of age and over, who have satisfactorily completed a series of general reasoning and mechanical aptitude tests which are given by the Employment Department of the Scovill Manufacturing Company, and who are approved by the Selection Subcommittee of the General Training Committee and/or by the foreman of the department to which assignment is to be made. American citizens are pre-

[1] As revised on 19 May 1947.

ferred. They must possess the physical fitness, specialised interest and industrious habits which are necessary to achieve skill in a mechanical skill or craft.

Type of Training

Training for each accepted trainee will be restricted to specialisation in one single type of machine-tool or bench work. The training schedule will provide for instruction in the operations which are normally performed in the specialised field to which the trainee is assigned — substantially as indicated in the schedules attached to this outline.

Outline of Course

The training course consists of 2,000 hours, divided into two periods of 1,000 hours each. The training may be provided in the general training room or in any toolroom or machine room where the necessary equipment is available and where the need for machine-tool specialists is indicated.

Probationary Period

The first four-week period (160 hours) is considered a probationary period. However, any member of the training course who fails to maintain required standards of performance or conduct, or otherwise indicates his inability to meet the requirements of the course, may be dismissed at any time.

Dismissal for Cause

The continuance of each member of the course beyond the probationary period depends upon the maintenance of proper standards of performance and conduct. Failure in this respect may be considered just cause for dismissal at any time.

Standard Period

The standard period consists of 1,000 hours of work. It is based on a normal operating schedule of 40 hours per week.

Pay Schedule

1st period (1,000 hours) : $1.09 per hour.
2nd period (1,001-2,000 hours) : $1.12 per hour.
Rate upon completion of training to be increased $0.25 per hour.

These rates are effective as of 19 May 1947 and are subject to any subsequent revisions.

Members of the general training course are subject to the same conditions regarding pay for overtime work as those governing other hourly-paid employees.

Pre-Training Credit

If a qualified applicant for specialised training is able to produce evidence of previous experience in the occupation in which he is to

be trained, or if his previous work history can be considered to be equivalent in any degree to such experience, the foreman of the department in which he is to receive training, after careful consideration and evaluation of the fact, may recommend that the trainee be started at a rate higher than the minimum appearing in the foregoing pay schedule, and the trainee's period of training may be correspondingly shortened.

Purchase of Tools

Members of the machine-tool specialist section of the general training course are expected to provided their own micrometers, gauges, scales and other small tools which may be required during the training period. A limited number of such tools are available for loan in each department in which training is provided, until the trainee has had a reasonable period in which to secure his own tools. Facilities are available for purchasing tools through the company.

Completion of Training

Upon satisfactory completion of the second period of training, the trainee will receive a certificate from the company indicating the specific occupation in which he has received specialised training. He will also be transferred from the training course and will be classified within the classification of the assigned occupation, provided such placement is available.

Note.

The above outline is subject to abandonment at any time as to any and all persons taking the course, or to change in any and every respect because of economic conditions, or if in the judgment of the General Training Committee and the management of the company, necessity for change exists.

No formal agreement, indenture, or contract is effected by acceptance of any individual in this section of the general training course.

Champion Paper and Fibre Company

In one of the divisions of the Champion Paper and Fibre Company, Hamilton, Ohio, the present training programme, which is organised under the Training Section of the Industrial Relations Department, consists of three phases, namely :

(*a*) supervisory training ;
(*b*) vocational training ; and
(*c*) institutional training.

These are defined and generally explained below. The company emphasises that its experience has indicated the importance of first establishing the general lines of a plant training programme and the procedure to be followed ; the content of the programme

and the material used for training can be developed, expanded or reduced according to the need of the particular plant or industry. The company also stresses the need for intensive research and analysis by each industrial undertaking of its own training requirements, as the basis for determining the content of the training programme.

Supervisory Training

Monthly meetings, of two hours' duration, are held, which are attended by all salaried supervisors in the plant. These meetings, or conferences, are held on company time, and attendance is considered as part of the supervisor's duty and responsibility. During the conferences problems of company-wide importance, including formulation of policies, determination of procedures, human relations problems, supervisory problems and management problems, are discussed and definite suggestions are made or conclusions drawn.

Minutes of the meetings are kept, and a report is prepared and forwarded to the management group. This report, by reflecting the views of the supervisors as a whole, is invaluable in assisting management in establishing policies or in solving problems to the satisfaction of all concerned. On all problems of a controversial nature, a direct reply is returned to the supervisor from management. This establishes a two-way line of communication between top management and supervisors that is vitally important to harmonious relations throughout the entire personnel.

This type of procedure does considerably more than train supervisors. It gives the company the benefit of group thinking regarding common problems, while at the same time it supplies supervisors with pertinent information and enables them to widen their thinking in the solution of their own problems. It also establishes supervisors as a definite part of management in that they have a certain responsibility for adhering to the policies that they themselves have had a part in formulating. It must be recognised, however, that supervisors attending the conferences must be assured that there will be no repercussion from statements made by them. Such an assurance, once given, greatly stimulates thinking and provides an opportunity for constructive criticism if necessary. This type of programme is not generally referred to as supervisory training in the plant, but is considered rather as providing foreman conferences in which all the supervisors are invited to participate. It does, however, accomplish the objective of imparting information to the supervisors that will aid them in more efficient operation of their various departments and the training of their workers.

Vocational Training

The vocational training programme of the plant has been in operation for several years. It provides facilities and opportunities for employees to improve themselves in the knowledge and skills required to do efficiently the job on which they are working or to acquire certain skills that are necessary satisfactorily to perform other jobs within the plant. On manipulative jobs, the material is prepared by the company and deals with specific fields of operation. In addition, under this

phase of the programme, local training and institutional facilities have been used and general education provided, consisting of such subjects as public speaking, psychology, accounting, statistics and higher mathematics. The content of such a programme must necessarily be highly diversified and dependent upon the personnel of the plant, since no vocational programme can be run successfully unless it provides facilities and includes opportunities for self-development according to the desires of the employees.

Institutional Training

Institutional training is a programme under which employees who wish to expand their knowledge or skills in a field that will benefit them in their work may take a course of training at a recognised university. The company subsidises such employees to the extent of one half the cost of books and tuition for such a course, providing the training will be useful in their work.

A Southern Textile Mill [1]

In one of the larger southern textile mills, the following plan was developed during the war by the Government's Bureau of Training, in co-operation with the company concerned, for the purpose of training new workers quickly for work in the textile mill and for upgrading experienced workers. The plan, while made to meet the needs of this one mill, is considered informative and suggestive for countries in which the textile industry is short of trained manpower.

The essential features of the training programme were :

(1) use of manning tables and replacement schedules ;
(2) training job instructors ;
(3) job progression charts ;
(4) operation sheets for each job ;
(5) training of new employees ; and
(6) training of maintenance men and loomfixers.

In setting up the plan, management and supervisory personnel of the plant met with representatives of the Apprentice-Training Service and exchanged information that contributed greatly to the development and execution of the training procedures adopted. The survey included consideration of labour and production requirements.

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[1] Extracts from War Manpower Commission, Bureau of Training : *Training New Workers Quickly in the Textile Industry* (Washington, 1944).

There was little uniformity in training methods, and few potential instructors had been given the principal job instruction techniques. For this reason, development of job instructor training techniques and of a well-trained staff of instructors consumed a considerable portion of the time required for formulating the overall training plan.

A training supervisor was appointed to co-ordinate all the training. To provide him with firsthand information, a general training advisory council, composed of management representatives and instructors, and various departmental advisory councils were formed. Training records and grading methods were established to serve as a part of the permanent personnel department file on trainees. Recommendations also were made to provide more orderly withdrawals of workers into military service.

The first step was a survey to determine those jobs in the plant where the need for replacement was greatest and to select the jobs which were best for initial practice and skills. Analysis of production in relation to the setting up of a plant training programme and replacement schedule was done on standard forms. To facilitate planning, work stations were diagrammed and the job assigned to each station was listed.

To develop a well-trained staff of teachers, methods were used similar to those outlined under "Job Instructor Training".[1] This training was spread to as many employees in all departments as was possible in order to speed the teaching programme. Special attention was given by instructors to the introduction of trainees to their new jobs and surroundings. To assure proper induction, a check list of the information given to a new employee was used.

Job progression charts were drawn up, showing the sequence of job difficulties in all divisions of the mill. Upgrading of workers to fill more highly skilled jobs as these became available was planned and jobs were arranged in the order of progression on a chart (see below, chart A). Also, training timetables were set up to give advance information to the production department on the approximate time trainees would be available for full service on a given job. (Suggested forms for the timetables are shown in chart B.)

Job descriptions were drawn up which were comprehensive enough to define a job, giving the sphere of activity and skills required, and providing sufficient information about each job so that the description could be used by the supervisor and training forces as a basis for developing a training schedule. An adequate list of job descriptions also justified some form of job rotation within a division of the mill. Job descriptions were not made extremely accurate, as they were used mostly as a "fence" around a job for people with only a passing knowledge of it. A brief job description was given on the heading of each operation sheet.

A training schedule based on the information revealed from job descriptions was prepared, listing all the jobs to be taught, breaking them down into their component parts, and providing the necessary job knowledge and teaching sequence. If no required sequence existed between jobs, they were arranged in the order of their difficulty, beginning with the jobs requiring the least amount of skill.

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[1] See Chapter V.

CHART A. UPGRADING SEQUENCE CHART FOR JOB CLASSIFICATIONS IN A COTTON TEXTILE PLANT

Carding:

Section hand
↑
Card grinder
↑
Card tender
↑
Card stopper
—

Slubber hand and fly frame tender
↑
Can turner
↑
Transfer hand
—

Draw frame tender
↑
Oiler

Spinning:

Fixer and section man
↑
Doffer
↑
Sizer
↑
Spinner
↑
Roving man
↑
Yarn man
↑
Band and idle pulley man
↑
Spindle oiler
↑
Oiler
↑
Cleaner

Spooling:

Section man
↑
Section man helper
↑
Spooler hand
↑
Yarn man
↑
Piece rocker
↑
Yarn cleaner
↑
Tailing machine hand

Warp Twisting, Warping and Winding:

Section man
↑
Twister tender
↑
Twister creeler
↑
Twister doffer
↑
Oiler
↑
Reel hand
—

Warper tender
↑
Warper helper
↑
Warper creeler
—

Winder tender
↑
Winder helper

Filling Twisting:

Section man
↑
Doffer
↑
Creeler
↑
Filling helper

Slashing:

Section man
↑
Slasher tender
↑
Size man
↑
Slasher helper
↑
Beam man

Beaming:

Beamer tender
↑
Beamer helper

Drawing-in and Tying-in:

Section man
↑
Drawing-in hand
↑
Drawing-in helper
—

Tying-in operator
↑
Tying-in helper

Weaving:

Loom fixer
↑
Weaver
↑
Tying-on warps
↑
Laying-up warps
↑
Pick-out hand
↑
Smash hand
↑
Battery hand
↑
Taking-off cloth
↑
Filling hauler
↑
Oiler
↑
Cloth hauler
↑
Loom blower
↑
Loom cleaner
↑
Overhead cleaner

Baling, Trading, Burling:

Folder hand
↑
Brander and sewer
↑
Press booker
↑
Head pressman
↑
Press helper
↑
Baler and sewer
↑
Grader
↑
Remnant hand
↑
Calender hand
↑
Burler

Operation sheets for each job similar to the one in chart C were prepared. To provide complete information, the department, operation, job description, and training time were listed in the heading. Based on the operation sheets, it was assumed that the operations listed would represent the teaching units for that job. Not more than 8 or 10 new ideas were included in a teaching unit, in order to prevent confusion of the learner. Each operation listed was broken down into steps,

and each step listed in the proper sequence for performance. In using the sheets for instructing, teachers divided the whole operation into groups of steps, and each step was based on material covered by the learner's previous experience, so that overlapping of training would not result. The instructor was then ready to proceed, keeping in mind that the trainee must master each group before proceeding to the next. Forms were prepared for recording the progress of trainees and are kept in a permanent office file. These forms include a suggested grading scheme, to indicate the quality of the work, which was also used in recording the progress of trainee workers.

CHART B. TRAINING TIMETABLE [1]

Department: Weaving Date report submitted: 22 Jan. 1943

By whom John Doe

Name	Loom cleaner	Oiler	Battery hand	Smash hand
John Reynolds	X	X	X	X
A. C. Crittenden	X	X	5 Oct.	10 Oct.
Oscar Sumner	—	—	2 Nov.	17 Nov.
Carl Bracks	1 Oct.	10 Oct.	X	X
R. Bannister	1 Oct	15 Oct.	5 Nov.	15 Nov.

Note: X means the workers can now do the job,
— means the worker doesn't need to learn the job.
The dates are those the supervisor has set for himself, to have the men able to do the job required.

[1] Timetable of dates trainees should be ready to perform various jobs.

Pre-employment training of high-school students was conducted to form a reserve of new workers who could take jobs in the mill with little additional training. For those students desiring to enter the mill, practice machines and instructors were provided at the school. Training away from the productive job required more time than training on the job; however, fundamental information and minimum practice in some basic job operations were given. In all courses of this nature the training followed the outline of actual work on the job. Each instructor had some practical knowledge of the job he taught, and worked closely with the plant training supervisor. Many of the operations

of the teaching unit were speeded up by having trainees study supplementary subjects, such as cotton mill mathematics, cloth calculations, safety rules, and other subjects that touched upon their job.

CHART C. OPERATION SHEET [1]

DEPARTMENT: *Carding* — TRAINING TIME:
OPERATION: *Card Tender* — *Approx.: 6 weeks*

JOB DESCRIPTION: Operation of a card (carding machine) which converts lap into sliver, cleaning and straightening the cotton fibre in the process; under close supervision of card grinder.

STEPS AND NECESSARY INFORMATION

1. *Lay full laps when old laps run out; place lap-rods on floor between the cards.* } Teaching Unit
   a. Run old lap out as near as possible before laying new lap. Do not let the lump at the tail go through card.
   b. Lap hauler removes lap rods. Safety precaution: Do not leave lap rods in dangerous position.
   c. After a line of laps has been laid check back and see if there are any laps splitting or running crooked. If so correct them.
   d. Place all lap waste in waste can.
2. *Piece up all ends in front.*
   a. Observe front ends regularly between other jobs so that ends can be constantly kept up.
   b. Place *all* waste in waste cans.
3. *Secure empty cans, doff full ones, and haul full cans to breaker drawing.*
   a. Empty cans can be secured from slubbers or drawing frames.
   b. Be sure cans are empty.
4. *Assist card grinder to move grinding rolls.*
   a. Under direction of card grinder.
5. *Clean fronts twice each shift.*
   a. Use piece of strip waste. Dirty fronts cause ends to come down.
6. *Mop card clean (once each week).*
   a. At time convenient to operator.
7. *Sweep beneath card.*
   a. Front and back — once each shift. Put waste in boxes and push full boxes to end of line of cards.
8. *Take down strips (just before stripping time); haul to end of card line.*
   a. Strip off waste into box.
9. *Clean scavenger (once each shift).*
   a. If scavenger roll gets too large, it will not stay in place.

[1] An operation sheet which can be used for planning the learner's training.

Apprenticeship training was conducted for a limited number of jobs. Relatively few cotton-mill jobs require the all-round skill that classifies them as apprenticeable. Among those that can be considered apprenticeable are the jobs of general maintenance, loom fixing, second hand, and supervisor. Apprentice training was given in the jobs of general maintenance and loom fixing, and charts were prepared listing the skills to be acquired and the approximate time that should be allowed for training.

In conducting apprenticeship training, careful consideration was given to the selection of apprentices, the term of training, the supervision of apprentices, related instruction, work processes, apprentice incentives and examinations. The apprenticeship training was sponsored and supervised by the training advisory council in the same manner that it functioned on other matters of training.

Visual-aid devices which were considered in teaching the training jobs and for the general education of the worker included such things as silent or sound films on safety practices at home or on the job, fundamental manufacturing processes in textiles, mill short-cuts and trade peculiarities, and the history of textile manufacturing. Other visual aids suggested were cut-away sections of machine models; glass-enclosed samples of defects in cloth; case histories and illustrations of modern streamlined production methods. Adequate textbook and reference materials for supplementary reading were made available.

This plan was made for one plant. Clearly, therefore, it must be modified for other mills to suit local conditions and requirements.

Annex

Training Methods and Materials

(Summary presented by the Training Director of the Eastman Kodak Company in a conference at Cornell University's School of Industrial and Labor Relations, on 8 May 1948.)

A. *Lecture* may be used in—

(1) supervisory or management training;
(2) training of staff in specialised fields;
(3) training of apprentices in related technical or job information;
(4) training of groups of employees in pre-assignment or post-assignment programmes.

B. *Demonstration* probably has its greatest application in job and apprentice training. It can, however, be used effectively in training technical staff. It has been used effectively in training employees who contact the public in banks, stores and public utilities. It has also been used effectively in some phases (especially the human relations field) of supervisory training.

C. *Illustration.* Probably one of the greatest uses to which illustration has been put is the getting across of an idea, a principle, or basic policy. Hence the hundreds of service companies that flood industry with idea-forming poster services. It can, however, be used effectively in job, apprentice, technical and supervisory training. It can take the form of—

still pictures;
slides;
sound-slide films;
silent and sound movies;
drawings;
sketches, etc.

Some job training in the optical field was greatly improved by the use of charts and sketches. It is the only form available when the trainer cannot point to the condition which must be observed by the operator. Example : a flaw in a lens or prism which can be seen only through a magnifying instrument, or a defect in adjustment of an instrument which produces definite distortions of image. In such cases a chart of defects as they appear under magnification will help the learner to identify them. A series of charts, sketches, or pictures showing defects in adjustment and the correction required will help the inexperienced assembler to master difficulties in a few hours which took months or weeks by the old methods of training.

D. *Conference or Directed Discussion* probably has its greatest application in supervisory training. It is useful, however, in training technical staff, and has been used effectively in training employees in customer and public relations. It is also effective in developing understanding in group training of operators and apprentices.

E. *Case Study* probably has its greatest application in supervisory training. It is useful in training personnel workers and public contact employees, and it can be applied in some phases of technical staff training.

The solution of practical problems in any field is the basis on which experience necessary to seasoned judgment is developed. If this is true, then the case study method of training should have a part in most training programmes. Its effectiveness, however, is limited unless the basic facts and principles involved in the solution are known to the group or are supplied by some type of presentation.

F. *Job Rotation.* In a small concern, job rotation is necessary to develop flexibility ; without it the enterprise would fail. Within larger concerns, job rotation in many smaller units is desirable to guard against disruptions due to absence and fluctuation of work. As pointed out earlier, this method has been used in the higher levels of management. In this field, however, it has serious limitations.

G. *Understudy* is probably still the most common type of training found in industry. It is used for every job from the newest sweeper to the president.

If all good workmen were equally good trainers, it probably, except in periods of change or expansion, might be sufficient. Unfortunately, however, all good workmen, non-supervisory and supervisory as well, are not good trainers.

In a live economy nothing is static. Policies, procedures and methods must keep abreast of constant change. Even though conditions are generally good, changes occur and differences of opinion do develop. Doing things as they have been done in the past is not enough. If a company is to keep pace with progress and maintain uniformity of purpose throughout its organisation, the understudy method of training is not sufficient.

However, in spite of its weaknesses, and they are many, the understudy method supplementing other methods will always serve, not only industry, but all other forms of enterprise in developing men and women for tomorrow.

X. Another method, which we will label " X " because it can be very good or very bad, might be called " Training Through Satire or Ridicule ".

This method is dangerous because the purpose of all training and other supervisory contacts with employees should be to build up, rather than tear down, the employee's confidence in, and respect for, himself and his supervisor. Therefore, to be good, training by this method must be directed at large groups of persons or at situations so ridiculous that personal offence cannot readily be taken.

A good example of this method of group training was the Navy's " Flat-Hatting Film " for pilot training. Its purpose was to develop a feeling that needless stunting by pilots is dangerous and undesirable. It has also been used effectively in accident prevention posters and films. The General Motors Corporation got out a booklet and films on the use of small tools in which the cartoons were of this type.

CHAPTER V

TRAINING WITHIN INDUSTRY FOR SUPERVISORS (T.W.I.)

The "Training Within Industry" programme for the use of management in the development of their supervisors began as an emergency wartime service to essential industries, but has become an established feature of industrial practice in the United States. The chief characteristic of T.W.I. is the emphasis on learning by doing in the field of supervisory skills — as has long been the practice in the field of mechanical skills. The T.W.I. approach is somewhat novel and its method unique.

During the war, T.W.I. was maintained as a Government agency. At the end of the war, it was discontinued as a public service, but in January 1946 a non-profit Training Within Industry Foundation, privately financed and operated, was set up to help industry to apply the T.W.I. principles and methods.[1]

The T.W.I., as now organised, is an example of a type of training assistance rendered to industry by private organisations supported by industry. There are other organisations doing equally useful work as training consultants to industry. The T.W.I.'s work is described primarily because it is based on an approach to training problems and a method of solving them which have evoked considerable interest in other countries.

T.W.I. operates as a specialised service to industry. Its basic

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[1] *The Training Within Industry Report, 1940-1945* (Washington, 1945). This report, which is the best source of published information in regard to T.W.I. principles and methods, includes a narrative account of T.W.I.'s experience and a technical section describing its programme. This change was foreshadowed in the final official report of the wartime T.W.I. Service, which pointed out:

> In peacetime the development of techniques for in-plant training and their use to get production results is so profitable that it is properly something which private enterprise should operate and pay for. The long-term use of these programmes in American industry is just now beginning. T.W.I. is like a new ship which has completed its trial run with a crew drawn from the builder's —and the ship is now turned over to the owners, American industrial plants and service organisations, to man and operate.

philosophy is that which was worked out and applied during the war ; its basic programmes are those which operated successfully over that period. One additional programme has been developed since the end of the war, and all the wartime programmes have been revised.

The Training Within Industry Foundation was established to :

(1) keep available the supervisory training programmes developed by T.W.I. as a wartime agency, and to adapt, improve and broaden them to meet current needs in industry and business ;

(2) continue T.W.I. co-operative research in the development of further techniques by which industry can help itself in the field of management.

T.W.I. helps management to uncover and analyse those production problems which can be met through training. Many of these lie at the supervisory level or must be dealt with there. It prepares one or more representatives of a company to instruct production line executives (foremen) and supervisors in the use of specific training methods and prepares staff executives charged with responsibility for training to develop their own individual training programmes.

T.W.I. states its constituent programmes in shop, rather than academic, language, and has standardised its methods in concise, specific and simple form. The fundamentals of its programmes have been defined as follows :

(1) It is necessary to have a specific method or pattern which the plant man can follow in solving his own problems. The method must be simple and briefly stated. Each of the T.W.I. programmes has a four-step method.

(2) The method is to be applied as a production tool ; it should be stated in shop terms.

(3) Technical perfection is not enough ; there must be something in the programme making for acceptance and use.

(4) In order that members of training groups can " learn by doing", groups must be kept small enough to permit time for guided, individual practice on everyday problems ; there is no substitute for practice.

(5) There must be a definite outline of what is to be covered, how much time will be given to each point and how it will be done, in order that there may be a recognised universal standard for the training sessions.

(6) Ten hours of content can best be organised in five two-hour meetings, each uninterrupted by intermission.

(7) Five meetings should be spaced over no longer an interval than two weeks. When new material is being learned, progress in learning is more rapid when the subject is fresh.

(8) Since training is an operating tool, it is wasteful to conduct it on a voluntary basis. Management must select the supervisors who are to be trained.

(9) The training should be conducted on company time and at company expense, since it is a technique aimed at improving production.

(10) The trainers who conduct the T.W.I. ten-hour programmes should be prepared in a four-weeks' institute course (one week's group work and individual coaching over the next three weeks).

T.W.I. bases its work on a five-needs concept of supervision, which has become a commonly accepted part of T.W.I. policy:

Every Supervisor has Five Needs

(1) *Knowledge of the work:* materials, tools, processes, products. These are different in each occupation.

(2) *Knowledge of responsibilities:* policies, agreements, regulations, schedules, inter-departmental relations. These are different in each company.

(3) *Skill in instructing:* increasing production by training supervisors in how to develop a well-trained work force.

(4) *Skill in improving methods:* utilising manpower, machines and materials more effectively by training supervisors in how to study critically present methods and to develop new methods.

(5) *Skill in leading:* increasing production by training supervisors in how to handle problems and how to prevent misunderstandings and improve their ability to work with individuals.

Types of Training

The main T.W.I. programmes developed to date are "Job Instruction", "Job Methods", "Job Relations", "Program Development" and "Discussion Leading".[1] The programmes have certain similarities in aim and method and subscribe to the T.W.I. fundamentals noted above.

Job Instruction

The aim of the T.W.I. "Job Instruction" programme is to train supervisors to help production workers to do their work quickly and correctly. The chief T.W.I. contribution in this field is a standardisation and streamlining of commonly accepted principles

[1] Another programme is now being worked out for the use of managers in developing their own assistants.

of good job instruction and the development of a standard method for their application.

This ten-hour programme is designed for all supervisors who are responsible for instructing workers on the job. It is carried out according to a standard method, applied with considerable rigidity. Qualified T.W.I. trainers (see below) conduct training programmes for groups of supervisors. Each group is limited to eight supervisors, selected by the management of the companies, on the basis of the supervisor's need for training rather than according to any yardstick of qualifications. T.W.I. programmes are not available to individuals as such, but only to the managements of establishments which use the programmes for the persons whom they select. Where a company is seriously interested in the job instruction training for supervisors, it is recommended that every supervisor should undergo the training.

The programme is carried out in five two-hour periods. The principle underlying the programme is that every supervisor needs to learn how to deal with the training problems he meets in his daily work ; the method is characterised by emphasis on practice, on learning by doing, so that those being trained begin to act from habit based on understanding.

In the first two-hour session, poor and good job instruction are contrasted by the trainer, who takes a carefully selected example. This first session is considered to be of vital importance in the training. It is aimed at showing the group : (1) that their own habits are much like other people's ; (2) that they are not particularly effective ; and (3) that there is a method which can produce better results. The demonstration is followed by an explanation of such a method. In other words, the first step is to arouse the interest of the group in learning a new way of coping with their job instruction problems, because, if their interest is not secured, the programme is doomed from the start, and it would be useless to explain to them the basic principles of the four-step method. The other four two-hour sessions provide each member of the group with individual practice and drill in making training timetables, breaking down jobs and giving instruction according to the standard four-step method.

This method is outlined as shown overleaf.

JOB INSTRUCTION CARD

JOB INSTRUCTION

How to Get Ready to Instruct

Have a Time Table—
how much skill you expect him to have, by what date.

Break Down the Job—
list important steps,
pick out the key points.
(Safety is always a key point.)

Have Everything Ready—
the right equipment, materials, and supplies.

Have the Workplace Properly Arranged—
just as the worker will be expected to keep it.

How to Instruct

1. PREPARE THE WORKER
   Put him at ease.
   State the job and find out what he already knows about it.
   Get him interested in learning job.
   Place in correct position.
2. PRESENT THE OPERATION
   Tell, show, and illustrate one IMPORTANT STEP at a time.
   Stress each KEY POINT.
   Instruct clearly, completely, and patiently, but no more than he can master.
3. TRY OUT PERFORMANCE
   Have him do the job—correct errors.
   Have him explain each KEY POINT to you as he does the job again.
   Make sure he understands.
   Continue until YOU know HE knows.
4. FOLLOW UP
   Put him on his own. Designate to whom he goes for help.
   Check frequently. Encourage questions.
   Taper off extra coaching and close follow-up.

If Worker Hasn't Learned,
the Instructor Hasn't Taught

TRAINING WITHIN INDUSTRY FOUNDATION
1946

The trainers conducting the job instruction programmes are trained in a T.W.I. institute to use a standard manual, which outlines in detail the content of each of the two-hour sessions and which they are required to follow exactly. The manual is designed for practical use ; it is laid out and printed in such a way that the trainers can work from it effectively. Reference material is provided at the end of the outline for the convenience of the trainer.

At the end of the ten hours, the supervisors are prepared to apply the method in their day-to-day work. It is recommended that members of the production line organisation should provide coaching in the daily use of the method, as needed by individual supervisors. Coaching is regarded as vital to the continuing practical use within industry of T.W.I. methods. The responsibility for ensuring that the method is used by those who have been trained rests squarely on the management, which should exercise it in the same way as it exercises its other responsibilities.

Job instruction training has been widely used in manufacturing industries. It has also been applied in many other types of

activity, such as sales, office, accounting, transport, storekeeping, drafting and retailing. It has been used by various public utilities, hotels, department stores, the civilian departments of the armed forces, Government agencies, etc.

Job Methods

The "Job Methods" training programme is designed to improve production supervision by training the supervisor to produce greater quantities of quality products as quickly as possible through making the best use of available manpower, machines and materials. The training is conducted by the regular five two-hour sessions attended by eight supervisors and led by a trainer who has been qualified by T.W.I.

The four steps of the programme are set forth below.

JOB METHODS CARD

JOB METHODS

How to Improve a Job

What problem should be tackled first ?
Review production schedules and output records.
Check cost, re-work, scrap, and accident figures.
Investigate "heavy" and "unpleasant" jobs.
Ask the boss where improvement of methods is needed most.

1. RECORD THE PRESENT METHOD.
   What is done ?
   How is it done ? What is used to do it ?
   Work with the operator to get a complete picture.
2. CHALLENGE EACH PART OF METHOD.
   Can this action be eliminated ?
   If not, how can it be done better ?
   Write down each idea.
3. DEVELOP THE NEW METHOD.
   Eliminate unnecessary actions.
   Simplify necessary parts of the job and make the work easier and safer.
   Use available manpower, machines, and materials.
4. GET THE NEW METHOD INTO USE.
   Develop proposal showing expected results.
   Clear with all concerned.
   Give credit for help.

AIDS FOR IMPROVEMENT

Consider "where"—"when"—"who".
Combine and rearrange operations, materials, tools, and equipment.
Look at the work-place and layout.
Study the materials, the type and how handled.
Use gravity feed and drop delivery chutes—mechanical lifts—conveyors—holders.
Pre-position the work.
Plan for use of both hands.

AIDS FOR PROPOSAL AND CLEARANCE

Figure production increases, cost decreases, effect on quality, relation to safety.
Consider effect on working relations and teamwork.
Sell to your boss.
Plan instruction in the new method.

Tackle Another Problem.

JOB METHODS

An intensive approach to managerial and supervisory problems of production, service, cost, and quality.

TRAINING WITHIN INDUSTRY FOUNDATION
1946

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The job methods programme was evaluated briefly by one of its wartime users in the following statement :

Though the basic principle of Job Methods Improvement . . . is in itself not new, the method IS NEW. . . Job Methods Training has to do with the breaking down of operational routines to their essentials, so that constructive analyses may be made, and from which practical results may be forthcoming. As has been said, there is nothing new in such a procedure. The difference lies, however, in the fact that J.M.T. *teaches* men *how* to intelligently analyse, and *how* to convey the results of such analyses to management in a clear and concise manner, so that effective action may be taken. There are many who can recognise better methods for improving production routines, BUT —and this is a big BUT—there are *few* men who know how to clearly describe, and set down, these suggestions for improvement. Job Methods Training has to do ONLY with the proper *methods* necessary to aid in the carrying out of improved job set-ups and routines. There is *no* attempt to interfere with technical matters, nor to trespass upon the functions of the industrial engineer, or the time study expert. Nor is Job Methods Training, in any sense of the word, a speed-up measure, as applied to the worker. Job Methods Training teaches job analyses, and how to intelligently present to management clear and understandable recommendations for improvement.[1]

Since the end of the war, the job methods programme has been completely revised, for the purpose of providing a simpler technique. The four steps indicated above are those of the revised version.

Job Relations

"Job Relations" training for supervisors, as developed through T.W.I., has no actual precedent in industrial practice though it derives in part from the scientific approach to human relations. Its essential aim is to teach supervisors how to deal effectively with the human problems arising in their handling of men, and emphasises how such problems may be prevented.

The training is given in the usual pattern of five two-hour sessions attended by eight supervisors designated by their managements. The first session demonstrates poor job relations practice and indicates the four-step method of sound job relations practice. The remaining sessions are devoted to individual practice in handling human relations at the supervisory level.

This four-step method is outlined as shown below.

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[1] W. H. GEBHART, American Supply and Machinery Manufacturers' Association, quoted in *The Training Within Industry Report, 1940-1945*, *op. cit.*, pp. 56-57.

JOB RELATIONS CARD

JOB RELATIONS

A Supervisor Gets Results through People

FOUNDATIONS FOR GOOD RELATIONS

Let each worker know how he is getting along.
Figure out what you expect of him.
Point out ways to improve.

Give credit when due.
Look for *extra* or *unusual* performance.
Tell him while "it's hot".

Tell people in advance about changes that will affect them.
Tell them WHY if possible.
Get them to accept the change.

Make best use of each person's ability.
Look for ability not now being used.
Never stand in a man's way.

People Must Be Treated As Individuals.

How to Handle a Job Relations Problem

DETERMINE OBJECTIVE

1. GET THE FACTS.
   Review the record.
   Find out what rules and plant customs apply.
   Talk with individuals concerned.
   Get opinions and feelings.

Be sure you have the whole story.

2. WEIGH AND DECIDE.
   Fit the facts together.
   Consider their bearing on each other.
   What possible actions are there ?
   Check practices and policies.
   Consider objective and effect on individual, group, and production.

Don't jump at conclusions.

3. TAKE ACTION.
   Are you going to handle this yourself ?
   Do you need help in handling ?
   Should you refer this to your supervisor ?
   Watch the timing of your action.

Don't pass the buck.

4. CHECK RESULTS.
   How soon will you follow up ?
   How often will you need to check ?
   Watch for changes in output, attitudes, and relationships.

Did your action help production ?

TRAINING WITHIN INDUSTRY FOUNDATION
1946

After the method has been shown, each of the supervisors handles a problem of his own, such as that presented by a man with home worries, a girl who refuses to rotate shifts, a crew unable to agree on hours, etc. The trainer emphasises special points by presenting several more problems to the group.

In some plants, shop stewards were brought into job relations sessions with supervisors ; in others, separate groups were formed. Adaptations were made for such groups as appeared to be required to promote full understanding of the programme.

Programme Development

The "Program Development" work of T.W.I. is aimed directly at getting management to accept its full responsibilities for the organisation and operation of its own over-all training plan. By experience, T.W.I. discovered that there was a need for skill in the field of designing training plans and programmes to meet production needs rather than as part of a comprehensive system of education. Consequently, a four-step method was worked out, established as shown overleaf.

PROGRAMME DEVELOPMENT CARD

PROGRAM DEVELOPMENT

How to Meet a Production Problem through Training

1. SPOT A PRODUCTION PROBLEM

Get supervisors and workers to tell about their current problems.
Uncover problems by reviewing records—performance, cost, turnover, rejects, accidents.
Anticipate problems resulting from changes—organisation, production, or policies.
Analyse this evidence.
Identify training needed.

Tackle One Specific Need at a Time.

2. DEVELOP A SPECIFIC PLAN

Who will be trained ?
What content ? Who can help determine ?
How can it be done best ?
Who should do the training ?
When should it be done—how long will it take ?
Where should it be done ?

Watch for Relation of This Plan to Other Current Training Plans and Programs.

3. GET PLAN INTO ACTION

Stress to management evidence of need—use facts and figures.
Present the expected results.
Discuss plan—content and methods.
Submit timetable for plan.
Train those who do the training.
Secure understanding and acceptance by those affected.
Fix responsibility for continuing use.

Be Sure Management Participates.

4. CHECK RESULTS

How can results be checked ? Against what evidence ?
What results will be looked for ?
Is management being informed—how ?
Is the plan being followed ?
How is it being kept in use ?
Are any changes necessary ?

Is the Plan Helping Production ?

Responsibility for Training Results

The LINE organisation has the responsibility for making continuing use of the knowledge and skills acquired through training as a regular part of the operating job.

The STAFF provides plans and technical "know-how", and does some things FOR but usually works THROUGH the line organisation.

TRAINING WITHIN INDUSTRY FOUNDATION
1946

The programme development technique follows the same pattern as the other T.W.I. programmes—demonstration of the need for the programme and of the four-step method, followed by individual practice in applying the method to the member's own problems. It is, however, a forty-hour, rather than a ten-hour, programme.

The "Program Development" institutes (courses) are organised in two parts—two consecutive days of work, followed, after a three weeks' interim, by three further days of work. They are attended by company officials who have major responsibilities for in-plant training and who are selected by the management of the company. The main purpose of the first part of the institute is to explain thoroughly the four-step method ; then, each member of the group works on one of his own company's problems and designs any needed training. After the interim period, during which each man is coached individually, these projects are discussed on the basis of the four-step method.

Discussion Leading

The T.W.I. "Discussion Leading" programme is based on the major principles of conference leading, largely on those used successfully for many years by industry. It includes the important points of the technique of conference leadership and concentrates attention solely on these selected points. The aim of the programme is to make every department head or foreman a competent discussion leader, able to draw out of the discussion what he wished from it. In every discussion meeting, the leader has—or should have — a clear-cut and precise objective ; he may wish for help of some kind from the group or he may wish to convince them about something : in either case, he needs their full co-operation. The programme follows the logical outline of stating the subject clearly, directing the discussion, with appraisal of progress at various stages, and, finally, getting acceptance of proposed actions, including allocation of responsibilities and fixing of timetables. It is thus designed to help each supervisor, in his discussions, to open and to make the best use of channels of communication between the leader and the group.

The "Discussion Leading" programme is arranged in four three-hour sessions, or twelve hours in all. The method follows the same general pattern as that underlying the other programmes : demonstration, explanation and individual practice.

Similarity of Method

The T.W.I. programmes described briefly above are applied, as noted, through a problem-solving method. The method itself is new, though none of its content is new. In all the T.W.I. programmes, fact-finding and an analysis of the facts are basic. This means the training timetable and the job breakdowns in job instruction, the listing and challenging of detail in job methods, the getting of facts and weighing them in job relations, the direction of discussion to a definite purpose in discussion leading, the identification of causes of production problems and the definition of training requirements in programme development, etc. In all the programmes, action (namely, instruction, improvement in method, handling a problem involving a worker, reaching agreements for action designing training) must be taken, and the results checked. All of them depend on willing action and teamwork. The T.W.I. report already cited emphasises the importance of habit-forming "learning by doing" in them all.

T.W.I. is convinced that, in any intensive training programmes of the type which it has developed and made available, the members must get practice, or they will not retain what they have learned in such concentrated form. Accordingly, all the T.W.I. programmes have increasingly given more session time to the member's own practice of his own problems, and related follow-up is stressed. Finally, T.W.I. has learned that development of a good programme is not enough ; standardised presentation alone is no guarantee of results ; and not even the acquiring of some skill is enough. Only when management understands, sponsors, participates and demands production results, can full usefulness of the programme be obtained ; and the chances of success are likely to be greater when the workers and their representatives appreciate the value of supervisory training and understand the T.W.I. method.

T.W.I. Trainers

Prospective trainers are prepared for their work through "Institutes", organised and operated by T.W.I. There is an institute for instructing trainers for each of the supervisory programmes—job instruction, job methods, job relations and discussion leading. (The programme development institute is held to prepare a company representative to use a method himself, not to become a trainer.)

Because T.W.I. programmes have to be standardised, the preparation of the trainers is of essential importance. They are not only drilled in putting on the sessions for the programme concerned, but are also given an understanding of each part of the content of the programme. The institutes are held at irregular intervals in different parts of the country ; their periodicity and location depending primarily upon industrial demands for the preparation of trainers.

Each institute is led by an "Institute Conductor", who works from a comprehensive outline. A trainer may be trained for one of the T.W.I. programmes or he may be trained for all of them. T.W.I.'s only requirement is that each trainer should complete the institute satisfactorily and handle his groups competently, as determined through follow-up by the institute conductor in the period immediately following the institute and through subsequent results on the job. T.W.I. issues certificates to those fulfilling this requirement.

In job instruction training, for example, the trainers are prepared through job instruction institutes, organised by the T.W.I. Foundation staff. The institute members are selected by the managements of their respective companies, with the help of a field representative of the Foundation where desired, and their expenses and training fee to T.W.I. are paid by the company. T.W.I. emphasises the desirability, wherever practicable, of training trainers within a company, and of having them a part of the management of that company, rather than calling in trainers from outside to train all the supervisors of the company. Where the trainer is on the company payroll, the management's interest is more firmly secured, the trainer's work is apt to be done more efficiently and more realistically and the opportunities for follow-up of those who go through the ten-hour sessions are much enlarged. To estimate the time required and to determine the number of trainers needed, consider a company which has 1,000 workers and about 100 supervisors. One trainer could train the whole group in job instruction in some six to seven weeks, training eight at a time in five two-hour periods (one group in the mornings, one in the afternoons). However, more lasting results are obtained by taking twelve to fourteen weeks, taking two groups at a time, but each meeting every other day over a two-week period. This gives one two-hour meeting per day, and the balance of the time is used for individual coaching. The same trainer can also be used as trainer for the other T.W.I. programmes, if he is qualified, and for other tasks relating directly or indirectly to the solution of training and other problems of supervision. But experience has shown that programmes should not be given too rapidly for good organisation.

After the week's institute, the members of the group return to their own companies and organise the ten-hour programme in their plant. Several of their sessions are attended by the institute conductor, who provides further training and coaching over this period. This supplementary coaching of trainers by the conductors has been found to be highly useful, as it helps to control and to improve the quality of the trainer's work.

T.W.I. Institute Conductors

The institute conductors are full-time members of the staff of the T.W.I. Foundation. At the present time they are all persons drawn from industry, with a practical industrial background and with wartime T.W.I. experience.

The "Multiplier Principle"

One of the features of the application of the T.W.I. programmes is the close relationship between the institute conductors, the trainers trained by them and the groups of supervisors being trained by the trainers. The first step is to lay out a complete plan for a given company or group of companies. The second step is for one or more institute conductors to train the trainers, who will train successive groups of people to use the method. This is known as the "multiplier principle", which runs through each one of the T.W.I. programmes. It results in rapidly spreading the use of the programmes by persons specifically trained for that purpose. This facilitates quality control and makes it possible to get the best out of the T.W.I. method.

Administrative Organisation

During the war, the T.W.I. Service operated as a Government agency, with a staff drawn largely from private industry. Technically, the Service was highly centralised, the programmes being worked out, conducted and standardised on the basis of exacting national standards. This process of standardisation was carried out, however, on the basis of numerous try-outs in different kinds and sizes of industries. Many hundreds of supervisors thus contributed to the development of the programme in its final form. Administratively, however, the service operated on a decentralised basis, with a very small headquarters staff. It worked in close co-operation with management and labour, largely through the use of management and labour advisers (nationally and at the district level) and industry and education consultants.

T.W.I. did not replace any existing vocational education, foremanship or other form of training. It made a point of supplementing other public and private training agencies, and of never competing with them or supplanting them.

At present, the Training Within Industry Foundation is organised as a non-profit service available to managements (members and non-members) at their request and expense. It is organised as a membership-supported foundation, its membership being made up of companies engaged in industry or business of one kind or another.[1] Four of the trustees of the Foundation were T.W.I.

[1] As in the case of certain other private institutions working in the field of personnel, industrial relations and training, foreign membership of the T.W.I. Foundation is open to companies or associations outside the United States who wish to keep in touch with the work, at least on a correspondence basis.

directors during the war. Three other trustees have been added. The board of trustees is responsible both for policy formation and for general management. One of the trustees serves as president and director of the Foundation, and another acts as vice-president and assistant director. The Foundation has an executive assistant, a co-ordinator of research, four field representatives and the necessary clerical staff. It carries out much of its work through the field representatives. Careful attention is given to their initial training and continuous supplementary coaching, since they constitute the doors of communication between T.W.I. and industry, and between T.W.I. and the fulfilment of its training objectives. It is planned to expand the field organisation as circumstances permit, consistent with the process of growth and the maintenance of standards. The T.W.I. staff is not recruited according to fixed principles or precise qualifications. T.W.I.'s general experience has been that in seeking staff one background is apt to be as good as another, except that the candidate should have some industrial production or business experience ; a certain amount of sales ability is likely to be helpful.

Research

At present, T.W.I. research work is largely centred in the Foundation headquarters staff. It is of a practical and experimental character. The Foundation believes very emphatically in keeping its ear to the industrial ground and in relating its activities to existing needs. The research work includes :

(1) surveying industrial training problems in relation to T.W.I. terms of reference and analysing training needs ;

(2) revising existing T.W.I. programmes and keeping them up to date, in emphasis, method and terminology ;

(3) developing new programmes ;

(4) publishing informational bulletins on various aspects of T.W.I. work and on various training problems ;

(5) answering enquiries from member companies and from other companies and associations, in the United States and outside.

Research is based on practical experiment. Each step in a new programme is tested in industry and perfected through experience of its operation at the level to which it is directed. Consultation with plant management is offered with the object of analysing and overcoming particular production bottlenecks through training.

Informational work is carried out to aid operating staff to plan and recommend training activities necessary for efficient industrial organisation.

Results of T.W.I.

The T.W.I. programmes played an important and indeed indispensable part in wartime manpower mobilisation in the United States, and they are continuing as a part of the country's industrial organisation. As the T.W.I. Foundation points out, one of the marked contributions of the programmes was the increased interest in and understanding of training as a production tool and the way in which people in the training field set about developing their own technical knowledge and skill in regard to the training of workers. Results of the T.W.I. programmes were measured in terms of production increases, reduction of waste, decreases in the time required for training and reduction of grievances. In the post-war period, there is no doubt that the T.W.I. method, characterised by its reduction to simple, understandable and practicable terms of essential principles of the training of men for supervisory work, will continue to show results along the same lines, particularly in the form of greater economic productivity and better human relations.

It might be mentioned, in conclusion, that T.W.I. work has stimulated the formation of training associations (professional associations of company training directors or supervisors). Their establishment provides a channel for the exchange of experience in this area of training and for encouraging the acceptance by management of its full responsibilities for the training of supervisory staff and workers.

CHAPTER VI

TRAINING CONDUCTED BY TRADE UNIONS

As indicated in the preceding chapters, trade unions in the United States have always shown a great deal of interest in general education and especially in training for employment. In addition to supporting and, in some instances, promoting national and State legislation providing for free schools and textbooks, they have encouraged and assisted the development of a national system of vocational education and apprenticeship.

Moreover, all the craft unions and many other unions have educational committees for the purpose of studying the training needs of their union and recommending methods to be used in meeting these needs. As one result of the work of these committees, some of the trade union organisations have established their own training programmes. These have been of great value to the worker in improving and keeping his skills up to date and in promoting greater versatility in making use of employment opportunities and also to the industry in providing a more efficient labour force. The activity of the unions in training the skilled workers needed in their industries or occupations has also created an area of common interest with the employers that has led to broader understanding between employers and workers.

From the beginning, the trade unions have recognised that, regardless of production methods and technological developments, the key to successful productive activity is the skilled craftsman. They have also realised that a man's employment possibilities, and hence his economic security, may be enhanced by versatile application of the skills of his trade. It is therefore natural that the unions encourage the broader phases of industrial training or apprenticeship for persons entering the occupation and trade extension training for improving the skills of those already employed. The trade union concern with these types of training has been noted in Chapters II and III.

While many industrial processes require unskilled and specialist or single-skill workers and modern methods provide for the

division of work for more efficient production, the unions have generally considered that this type of training can best be done on the job, and they co-operate with the employer in these training activities, as indicated in Chapter IV.

The training activities of the unions include provision for training committees in the local unions (sometimes a joint committee established in co-operation with the employers, often known as an apprenticeship committee or apprenticeship and training committee), trade union training conferences, correspondence courses organised from the union headquarters, and technical trade schools or classes operated by the union or with the active participation of the union for the benefit of the workers entering or already in the occupation. In addition, trade union journals publish information on successful training activities in a locality or a series of lessons on trade practices, prepared in order to broaden the trade knowledge of their readers.

The following example of trade union training is considered to be representative and to show the interest taken by the unions and their activity in encouraging and providing training related to employment requirements and to the needs of their own members.

Technical Trade Training of the International Printing Pressmen and Assistants' Union of North America

The International Printing Pressmen and Assistants' Union of North America resolved in 1909 to promote technical trade education in the printing industry of America. At this time, there was some opposition to this activity from its own members, who interpreted the move as aiming at the training of more apprentices than could be employed by the industry; and some employers also objected as they considered that the union's training activities might interfere with the prerogatives of management.

Since 1909, the training activities of the union have grown in number and scope and recently the union opened a new and enlarged Technical Trade School. On this occasion, a brochure was published by the union, with a preface by its president which contained the following statement :

> From time to time the enquiry is made, why should a trade union be engaged in technical education ? The answer is one of simplicity. We are interested in the furtherance of the financial and physical wellbeing of the industry in which our members are engaged. Further,

we acknowledge without reservation that better printing and more printing constitute the foundation upon which the economic well-being of our members rests.[1]

The training activities have been so successful from the related standpoints of service to the union members and to the industry that they have been steadily expanded. At present, they include the following services :

(1) A Technical Trade School with the latest equipment.

(2) A correspondence course for apprentices.

(3) A correspondence course for adults.

(4) Frequent conferences on technical phases of printing work.

(5) Technical service to employers in the most up-to-date engineering practices and production procedures.

The training activities of the Trade School are financed largely by the union. Charges are nominal and do not constitute a barrier for anyone working in a pressroom who cares to take advantage of any of the training offered.

The Technical Trade School has expressed its responsibility to adult workers in the union as follows : "Printing is an ever-changing craft requiring skill beyond the ordinary and men must change their techniques and methods as well as learning new machines in order to advance." The school has these objectives :

(1) to provide highly intensive courses in various methods and processes of printing as generally used and new processes as they are introduced to the industry in order that members of the International Printing Pressmen and Assistants' Union may be in a position to meet technological advances and changes in the printing industry ;

(2) to aid in the efficient introduction and operation of any new method, process or machine which managements may elect to use in the production of printing ;

(3) to increase the knowledge and skill of the men who do the actual printing and co-operate in solving any printing problems encountered ;

(4) to contribute to the development of better craftsmanship and successful operation of printing plants in order that the industry may become more prosperous and continue its successful advancement to the material good of all concerned.

To meet these objectives, the Technical Trade School offers short intensive courses on all types of equipment and processes used in printing. These are open to members of the union who are qualified technically to follow the course and who wish to do so.

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[1] *The New Home of the Technical Trade School of the International Printing Pressmen and Assistants' Union of North America* (Rogersville, Tenn., 1948).

In some cases, the employers request certain members of their staff to attend the school to learn how to operate a new machine or to master a new process. The instruction is directed towards the needs of each individual. It is intensive and specialised ; each course is organised as a unit covering a specific phase of printing work. All the training is given on an individual basis, with the exception of training in some highly complicated and unusual adjustment, which is usually conducted for groups of three or four.

The training to be given the individual worker is determined after his arrival at the school. Since all the trainees are employed in the industry and are skilled or experienced in most phases of the work, their training needs are highly specialised. Usually, it is a question of training in a new process or in the use of new equipment to be installed in the employers' shop. In some instance, a man elects to take the training for the purpose of keeping up with improved methods in the industry and for increasing his earning power.

The Technical School is located at the headquarters of the International Union, twelve miles from the nearest town, in a valley of the Smokey Mountains of Tennessee.[1] The school represents all the departments of a well-developed printing establishment and is equipped with the latest equipment. The major emphasis and the greatest amount of equipment is in the pressroom. It contains the preparatory departments (art, composing and platemaking departments), the pressroom, classrooms, extensive facilities for the correspondence school, the printing museum, a technical library and an auditorium. In the Technical School, intensive and advanced courses are conducted throughout the day for the number of weeks needed to meet the trainee's requirements, which vary from a minimum of five to six weeks to a maximum of twelve weeks, the average course being about ten weeks.

The Technical School also maintains a staff of expert servicemen who are sent to printing plants in order to expand production and improve the quality of the work, and to instruct others in new methods and machines. Numerous printing problems are submitted to the service staff for analysis, and these men also cooperate with manufacturers and suppliers of materials in testing new machines and materials. The assistance of the chemists, engineers and manufacturers of the industry is helpful, in turn, in

[1] At the site of the school and union headquarters, there is also a home for aged printers, a hospital and a modern hotel, all organised and maintained by the union.

keeping the school's training courses and equipment up to date. It is not uncommon for a new printing press to be sent to the school for a trial run and to be used for instructional purposes before it is in extensive use in the industry.

The school is open the year round and on occasion has been forced to operate on a two-shift per day basis. At all times it has carefully limited the number of men in training in order that each might receive personal instruction and supervised experience in a relatively short time.

The Technical Trade School conducts twelve different correspondence courses in presswork.[1] The first group of courses are in cylinder and job-cylinder printing, platen and job-cylinder printing, newspaper printing, rotary printing, offset printing, and gravure printing. These are made up of lessons prepared especially for apprentice pressmen to meet certain definite educational standards. They are made available to registered apprentices without charge. The completion of one of these courses is a requirement for apprentices applying for journeyman status in the union. The second group of courses, covering the same aspects of printing work, are prepared for the use of journeymen members, to supplement their theoretical and practical knowledge and to give them a broader knowledge of a very diversified trade. These courses are made available to union members at a cost that is less than the cost of printing them. The courses are printed in looseleaf form so that new information may be added as needed. They provide up-to-date information on presswork, together with samples showing causes of trouble and remedies, personal advice from executives, criticism of work and other individual services. The material is written by practical men with long experience in the industry and is offered only to men who are actually engaged in the printing trade. The Technical Trade School has found that its correspondence courses have proved thoroughly successful and have enabled hundreds of pressroom workers to increase their earning power.

The International Printing Pressmen and Assistants' Union has always considered that the most satisfactory method to use for the training of new workers for the industry is by the use of an apprenticeship programme conducted in the employer's plant. Among its first training activities was the establishment of local educational committees, usually known as examination boards. The

[1] Because of the great demand for these courses, ten additional correspondence courses are either being prepared or have been planned.

function of the board is to examine the apprentice for competency, in co-operation with the Technical Trade School. The first twelve quarters of the apprentice schedules are dealt with by the examination board and the last four quarters are handled by the union school. The training of apprentices has always been considered of common interest to the employer and the union. For many years, the union has co-operated with the employers in an effort to improve apprentice training standards. Recently a programme of apprenticeship was developed jointly. It contains standards deriving from the traditional practices used by the industry and was prepared for the purpose of encouraging the industry to co-operate in providing more effective training for future apprentices. The standards follow the pattern of other national trade apprenticeship programmes, suggesting improvements, *inter alia*, in work schedules for training, methods of selection, progressive wage schedules, and apprentice supervision. In addition to being successful in the training given them on the job, printing trades apprentices are required, as noted, to complete a correspondence course prepared for their branch of the industry by the union's Technical Trade School. During training, they are encouraged to send in problems they encounter on the job and samples of their work for criticism. The pressman apprentice can thus at need call upon the continuous assistance of a trained staff at the Technical Trade School.

CHAPTER VII

PROVISION FOR SPECIAL TRAINING NEEDS

This chapter indicates briefly the provision for training made for—

(a) ex-service personnel ;
(b) women ; and
(c) disabled persons.

It should be emphasised at the outset that none of these groups is regarded in the United States as constituting a special training problem, with the exception of limited numbers of seriously disabled persons for whom special arrangements must be made. In general, the same training facilities and the same principles and methods are used as in respect of all other trainees. However, each of these groups has or may have certain special needs in the field of vocational training. The aim of the present chapter is to describe briefly what has been done to meet these needs. It cannot be too strongly stressed, however, that the skills and knowledge needed for a particular job or occupation remain the same regardless of whether the person seeking the training is an ex-service man, a woman, a disabled person or any other worker. The objective here is not to suggest any need to make special provision for separate training for particular groups of workers, but rather to show what has been or is being done to ensure full training opportunities for all.

A. Vocational Training for Ex-Service Personnel

The Servicemen's Readjustment Act of 1944 (Public Law No. 346, 78th Congress, as amended) provides a comprehensive range of vocational training opportunities for ex-service men—

(a) who were on active military service sometime between 16 September 1940 and 25 July 1947 ; and

(b) who served 90 days or more or were discharged for a disability incurred in service ; and

(c) who were discharged under conditions other than dishonourable.[1]

Objective

The objective of the scheme for the education and training of war veterans is twofold :

(a) to facilitate the return of ex-service personnel to civil life and give them full opportunity to develop, improve or adapt their skills ; and

(b) to provide a stimulus to the building up of the skills and abilities needed for national economic and social life.

Types of Training

In general, the aim has been to use the existing training facilities, so far as possible, in meeting war veterans' training requirements. The vocational training programmes for veterans include training in approved schools, colleges, universities and professional and technical schools, apprentice training and other on-the-job training, and part institutional and part on-the-job training. Training is provided for any occupation recognised as requiring systematic training by Federal or State agencies concerned with vocational training and for any vocational, technical, professional or supervisory skilled category.

Training in Vocational Schools

The State vocational education authorities supervise the training of veterans in the vocational schools and classes, and are responsible for designating the schools approved as suitable for the training of war veterans. The war veteran obtains a certificate of eligibility from the Veterans Administration and presents the certificate to the school which he has chosen to enter. The school itself is responsible for selection, and in admission to vocational school training, war veterans receive preference over other persons. Tuition and certain other costs (books, supplies, equipment, etc.) up to a fixed maximum for a school year are paid to the school for the trainee by the Veterans Administration.

Preparatory trade and industrial training for younger war veterans was introduced under the Federal-State programme. It

[1] Disabled service men have special training opportunities, provided in accordance with the provisions of the Vocational Rehabilitation Act of 1945 (Public Law No. 16); this is noted briefly in section C of this chapter.

was recognised that many of the veterans could not be included in regular classes with younger persons lacking experience. In some localities, special vocational schools have been opened for war veterans. In many cases, however, they have received training along with young persons taking pre-employment courses or with employed persons, including apprentices, enrolled in supplementary or extension trade courses. The organisation of the courses and the methods of training do not differ appreciably from those applicable to other workers, which are outlined in Chapter II above.

During training in schools or educational institutions (and for two months thereafter), veterans receive a monthly allowance, ($75 a month if they have no dependants, $105 if they have one dependant, and $120 if they have more than one dependant).

A veteran is entitled to take vocational training at Government expense and to draw subsistence allowance for a year plus a period equal to the time he served in the armed forces between September 1940 and July 1947, up to a total of four calendar years.

Apprentice Training

Ex-service men have been encouraged to take apprentice training and to become all-round skilled workers. A great many of them have taken such training.

Applications for subsistence for veterans entering apprentice training are filed with the regional office of the Veterans Administration. The office provides the veteran with a certificate of eligibility, which he presents to the establishment where he wishes to take his apprentice training. This establishment must be certified to the Veterans Administration by the appropriate State apprenticeship agency as fully qualified and equipped to provide apprentice training. Unless this is done, the ex-service man may not receive his subsistence allowance.

Selection for apprenticeship is made by the appropriate local joint trade apprenticeship committee or by the plant management-labour apprenticeship committee or by the management of the industrial establishment concerned. As noted above, a general preference in admission to apprenticeship is granted to ex-service personnel, and as a rule the veteran is deemed to be the age he would have been had he entered apprenticeship before his war service.

While employed as an apprentice in an approved industrial establishment, the veteran may receive a monthly subsistence

allowance (fixed at not more than $65 a month if he has no dependants or $90 a month if he has dependants), provided that his wages as an apprentice plus his subsistence allowance do not exceed a maximum amount ($210 per month for a veteran without dependants, $270 for a veteran with one dependant and $290 for a veteran with more than one dependant). Any amount over

By courtesy of the Veterans Administration.

An apprentice welder under the Veterans Administration job training programme operating an automatic welding machine at the boiler works where he used to be employed before his service overseas.

the maximum is deducted from the subsistence allowance. The main principle is that the total amount received by a war veteran in apprenticeship (*i.e.*, the apprentice wage plus the monthly subsistence allowance) should not at any time exceed the wage rate of a journeyman in the trade which the apprentice is learning.

As indicated in Chapter III above, the apprentice may be given credit for experience of training in the forces or before he entered military service, enabling him to start as an " advanced " apprentice and thereby shortening the required time of apprenticeship.[1] If an apprentice is given credit for experience, he is paid the

[1] Procedure for determining credit is described in a Bureau of Apprenticeship bulletin (mimeographed), entitled *Apprenticeship Credit for Previous Experience* (Washington, 1947).

wage rate applicable to the level at which he starts. Credit is decided by the employer or the local joint apprenticeship committee.

Other On-the-Job Training

Besides apprenticeship training, other on-the-job training may be taken by a veteran provided that the course lasts not less than

By courtesy of the Veterans Administration.

The proprietor of a welding and machine shop established on a G.I. loan instructing another war veteran, who is training on the job, in the operation of an acetylene torch.

three months and not more than two years. Each industrial establishment is free to work out its own plant training programme for veterans or for an individual veteran. The competent State approving authorities (appointed by the Governor), usually a State Board for Vocational Education or an Appenticeship Council, must approve the industrial establishments in which the veteran may take on-the-job training other than apprenticeship. He obtains his certificate of eligibility from the Veterans Administration and submits it to the industrial establishment in which he proposes to take his course of on-the-job training. The establishment endorses the certificate and forwards it to the Veterans Administration, thereby entitling the veteran to receive his subsistence allowance. During on-the-job training a war veteran

receives the full amount of subsistence allowance ($65 a month if he has no dependants or $90 a month if he has dependants), provided that his training wages do not exceed $210 a month if no dependants, $270 with one dependant or $290 with more than one

By courtesy of the Veterans Administration.

Ex-service men discussing a phase of sphere polishing as they learn to be journeymen surface grinders at an optical firm's laboratory.

dependant. Any amount over the fixed maximum is deducted from the subsistence allowance. The ceiling does not apply in cases where the beginning wage for trained workers is lower than the ceiling. The Veterans Administration furnishes the trainee with the tools and equipment necessary for the selected course of on-the-job training, provided that these supplies are required of all the other trainees taking the same course and that the cost is not customarily borne by the employer.

In order to overcome abuses of on-the-job training for veterans arising largely out of a lack of any clear principles and practices to govern such training, an inter-agency committee for the development of criteria and standards for on-the-job training was set

up in 1946 and subsequently worked out "Recommended Minimum Criteria for Approval of Establishments offering Non-Agricultural On-the-job Training for Veterans". These standards, which served as a guide to the various State agencies responsible for approving on-the-job training programmes for veterans, to employers offering the training and to the trade unions whose interests are affected by the programme, and which have been incorporated in the amended Servicemen's Readjustment Act, are as follows:

(a) The training content of the programme is adequate to qualify the veteran for appointment to the job for which he is to be trained.

(b) There is reasonable certainty that the job for which the veteran is to be trained will be available to him at the end of the training period.

(c) The job is one in which progression and appointment to the next higher classification are based upon skills learned through organised training on the job and not on such factors as length of service and normal turnover.

(d) The wages to be paid the veteran for each successive period of training are not less than those customarily paid in the establishment and the community to a learner in the same job and who is not a veteran, and are in conformity with State and Federal laws and applicable bargaining agreements.

(e) The job customarily requires a period of training of not less than three months and not more than two years of full-time training.

(f) The length of the training period is no longer than that customarily required by the establishment and other establishments in the community to provide the trainee with the required skills, arrange for the acquiring of job knowledge, technical information, and other facts which the trainee will need to learn in order to become competent on the job for which he is being trained.

(g) Provision is made for related instruction for the individual veteran who may need it.

(h) There is in the establishment adequate space, equipment, instructional material and instructor personnel to provide satisfactory training on the job.

(i) Adequate records are kept to show the progress made by the veteran towards his job objective, and a periodic report showing the conduct and progress made in the course of training is made to the Veterans Administration.

(j) Appropriate credit is given the veteran for previous job experience, whether in the military service or elsewhere, his beginning wage being adjusted to the level to which such credit advances him, and his training period shortened accordingly. No course of training will be considered *bona fide* if given to a veteran who is already qualified by training and experience for the job objective.

(k) A copy of the training programme as approved by the State agency is provided to the veteran and to the Veterans Administration by the employer.

(l) Upon completion of the training, the veteran is given a certificate indicating the length and type of training provided and that the veteran has completed the course of training on the job satisfactorily.

This type of on-the-job training for war veterans is a somewhat new development in the industrial training field and may be of particular interest to other countries, because of the more intensive and practical character of much of the training offered in this way.

Part Institutional and Part On-the-Job Training

A good many veterans are taking a combined training, part in vocational or technical schools and part on the job. In such training, the veteran is also entitled to receive monthly subsistence allowance up to a fixed maximum of subsistence plus wages from work.

B. Training of Women for Production Work [1]

In the United States it is generally recognised that the principles and methods of training women for production work are the same as those for training men. What a worker must know and do on a given job does not vary with sex. Therefore, women are trained side by side with men for occupations in which both are employed, such as draughtsmanship and bindery work. For occupations in which women predominate, such as power-sewing, and for occupations like the building trades, in which men are employed almost exclusively, classes may be organised for women alone and for men alone respectively.

Since public school vocational training is provided to meet local demands for workers, most of the work offered is trade training for occupations in which relatively large numbers are employed in the community. By tradition, many of these occupations employ primarily women or men, as the case may be, and therefore many vocational schools have a girls' department and a boys' department; some cities have a girls' vocational school and one or more boys' vocational schools. Over the years, however, as more women have entered "men's" occupations and *vice versa*, the general trend, accelerated by the second World War, has been towards complete co-education in vocational schools as well as in other types of secondary schools.

On-the-job training has been affected similarly by the fact that women predominate in certain light manufacturing operations, such as packing and assembling small parts, while men predominate

[1] The WOMEN'S BUREAU in the U.S. Department of Labor, which has summarised its general experience in the present statement, will be glad to provide on request further information on the training of women for production work in the United States.

in heavy manufacturing. Therefore, some plant instruction may be primarily for women in the one case, or primarily for men in the other. The principles followed and the methods used, however, are the same.

In normal times, therefore, the major problem peculiar to the training of women has been to keep open the avenues to training for the minority of women who wish to enter occupations which have traditionally been filled by men in the local community.

Special problems arise in an emergency, however, when large numbers of women must be quickly trained for jobs in trades or industries in which they would not ordinarily be offered or be seeking employment. During the second World War, for example, two major problems concerned with the training of women arose :

(1) How could women who were doing non-essential work be quickly trained in the skills needed in the manufacture of war material, predominantly heavy-goods industries ?

(2) How could women who had never before worked outside their own homes be quickly trained for production work in industry ?

It was recognised that the women without any work experience outside their own homes presented the most difficult problem because they had not only to acquire job skills and the work-ways of a particular industry and plant, but they had also to learn the work habits, customs and relationships that characterise the large-scale manufacturing establishments typical of the United States. Often, therefore, before any instruction in job skills was undertaken, many of these women were given orientation training according to their needs. They were taught how to punch a time clock, how and when to report to supervisors ; they were informed regarding the rules and regulations governing their work and the facilities for their comfort (food services, restrooms, dispensaries, transportation, cheque-cashing, etc.) ; they were instructed how to give notice of absence, how to obtain needed information, and how to make suggestions for the improvement of the work. Their relationships to each other, to their supervisors, and to the organisation by which they were employed, were clarified. Customs and procedures peculiar to the plant were also discussed.

Such orientation training is becoming more and more customary for all new employees in large manufacturing plants, where there are enough new workers to organise classes periodically. This type of training, however, was used more widely in wartime

because the rate of hiring was so high that it was practical to provide orientation classes almost continuously, or at least frequently, in large Government and private establishments. It proved to be especially valuable in familiarising women workers with industrial work.

In steel and other heavy industries, where few women had been employed in production except in wartime, it was also found advisable to prepare the men workers, and especially the men foremen and supervisors, for the entrance of women into the plant or into the departments in which only men had been employed. Sometimes a series of classes was scheduled to discuss problems that might arise and to develop a co-operative working attitude among the men already employed towards the new women workers.

The skills and knowledge needed for a particular job, as mentioned before, remain identical for women and for men. However, where the skill and knowledge needed involve scarce abilities, or where the training period is prohibitively long, job analyses are desirable to see how a skilled job may be broken down so that most of it may be done by a semi-skilled person. This breaking-down of jobs into further specialities made it possible in the second World War to use large numbers of women and inexperienced men, who were trained, directed and supervised by a small core of highly skilled persons. Besides breaking the job down to reduce the skills required and therefore the training period involved, successful efforts were also made to adapt machinery and equipment suited for the average man to the average woman. This meant lowering equipment in some cases, raising it in others, and making a variety of other adjustments which reduced the muscular or nerve strain of a job.

Following the job analyses, the problem remained of training women for the changed jobs and also for the many jobs which remained the same either because they did not lend themselves to further specialisation or because the circumstances made a change impracticable. The objective to be attained remained the same — the skills and knowledge to do the job. The difference was in the prior experience of available trainees. Experienced men workers, and even many boys from school, generally start off with some knowledge of hand tools of various kinds, of shop arithmetic and calculating and of the terminology common to simple mechanical or woodworking jobs. Before women were prepared to follow the same production training course as men, most of them had to acquire this terminology and familiarity with tools. Preliminary

By courtesy of the U.S. Office of Education.

Optical lens grinding.

By courtesy of the U.S. Office of Education.

Woman trainee operating a crimping machine on a sheetmetal tank.

training sessions were sometimes designed to overcome these initial handicaps. Another method was to allow women more time to conclude a training programme in which both men and women were enrolled. In some cases, notably in preparation for shipyard work, the atmosphere of the new work environment (noise, etc.) was introduced into the school pre-employment training programme to condition women to these elements before they went on the job.

Safety training for women, as for men, may be given as a separate course, included as a unit in an orientation course or given along with the job training. It is often given in all these ways and further supplemented by periodic sessions throughout the work project. Here, too, the principles and methods are the same for the training of women as for men. But because of the physiological differences between men and women and because of different traditions in clothing and habits which affect safety, special units were introduced into the safety and health training for women. Special clothing regulations (such as the use of caps, the wearing of overalls, the elimination of jewellery) were necessary in most plants because of the hazards of moving machinery and equipment. Certain limitations on lifting and other muscular work were sometimes made on the basis of plant experience or State laws and regulations. In such matters as these, women had to be instructed in class or on the job. In addition, caution regarding responsibility for the safety of others as well as of oneself was constantly emphasised, especially with new workers who had never witnessed an industrial accident.

During an emergency, many married women, as well as single women with home responsibilities who do not normally wish to be in the labour market, are recruited to help with production. For these women in particular, special aids to enable them to combine home and factory schedule without undue strain were found helpful. Information on facilities and services available to such women to ease their loads was often supplied in the orientation training. In some communities, the public schools gave special instruction in homemaking tasks, such as in meal preparation, which reduced the time for this task remarkably without sacrificing the nutrition of the family. Special counsellors were also introduced in many plants to help individual women with personal problems affecting their attendance and performance on the job.

Whenever inexperienced workers, men or women, are used for the first time, selection techniques and adequate information can reduce the waste involved in training persons who will not be able

to do the work or will not like it well enough to continue on the job as long as they are needed. It is especially desirable, where turnover is high, to eliminate at the start those who will certainly not survive the training course and to eliminate from training along the way those who lack aptitude or other qualifications for the work. It is also important to have a trial period following initial training for those who have had no prior work experience, during which they can be tried out on the job, and can try out the job, under supervisors able to assist them in adjustment to the job and to suggest, where appropriate, transfers or other more suitable work.

Except in an emergency, most training for semi-skilled factory work is given most economically and efficiently on the job in the plant. It is in such jobs, and in a few skilled jobs, that women are usually employed. For the latter, some women take training in vocational schools ; women in skilled occupations in which men predominate take technical training in a vocational or technical school or through an apprenticeship. Since these women are few in number and have special interest and motivation, there is no need to treat them differently. It is only when large numbers of women must be trained quickly for work which women do not normally do that the need for special training arises. This training can often be given to advantage before assignment to a job, either in the plant or outside in a school. However, as previously noted, the length and time and place of training, as well as the schedule, will depend upon factors which vary with the work, the plant, the employment situation and the customs and traditions of the local community. All these must be taken into consideration in the training of women and in applying basic principles and methods of training for productive work.

C. Special Provision for the Retraining of Disabled Adult Workers

The vocational retraining programme for disabled persons grew up after the war of 1914-1918. An Act was passed in 1920 "to provide for the promotion of vocational rehabilitation of persons disabled in industry and otherwise and their return to civil employment". This programme was supplemented by special services for disabled war veterans, organised as a separate and distinct programme. During the inter-war years, the general rehabilitation programme, organised on a Federal-State basis, was developed and improved. In the years immediately preceding the recent war,

the Employment Service began to build up a special programme for selective placement of the handicapped, which has been effectively integrated with the arrangements for the training of such workers.

All these programmes were greatly developed during the recent war. In 1943, the Vocational Rehabilitation Amendments Act (Public Law No. 113, 78th Congress) was passed to enlarge and improve the civilian rehabilitation programme (in particular, by extending services to the mentally handicapped); in the same year, the vocational rehabilitation programme for war veterans was put into operation and was given legislative basis (Public Law No. 16, 78th Congress).

At present, responsibility for the vocational training of disabled persons is shared between two Federal agencies, the Office of Vocational Rehabilitation of the Federal Security Agency and the Vocational Rehabilitation Service of the Veterans Administration. The first agency deals with persons disabled in industry or otherwise and the second exclusively with disabled veterans of the second World War with service-connected disabilities.

General Policy and Organisation

In general, disabled persons are retrained by existing agencies and in company with able-bodied workers. This is true for veteran as well as for civilian disabled. As a general rule, special projects have not been set up. The policy is that there should be no segregation of the able-bodied and the disabled. As indicated later, the more seriously disabled workers receive retraining from private agencies as a rule, and not in company with the able-bodied. After such training, however, they may attend further training in a regular course for able-bodied workers, run by a public agency or by private employers. Moreover, severely disabled persons requiring less competitive conditions are provided with special employment opportunities in workshops.

Training and retraining for disabled persons is given in public and private vocational and technical schools and institutions, in vocational courses of all kinds and in employers' plants on the job or in vestibule or plant training schools.

The policy of the Office of Vocational Rehabilitation on training for persons being rehabilitated under the Federal-State programme is based on the principle that training is a major avenue of preparation for employment, and that, so far as possible, a dis-

abled person should be trained for an occupation in which his disability does not interfere and which is commensurate with his abilities and interests, so that he may compete successfully for employment with able-bodied persons. At the same time, it is recognised that many disabled persons require a variety of services prior to training. Under the provisions of Public Law No. 113, therefore, training assumes the position of one of many types of services, such as medical and surgical treatment, hospitalisation and occupational therapy, which may be drawn upon by the rehabilitation agency to prepare a disabled person for employment.

Under the Federal-State rehabilitation programme, training is now available to mentally and physically disabled persons as one means of preparing them for employment, irrespective of their financial status. Training is defined in broad terms and is intended to include mental and physical training, pre-vocational, vocational and supplementary training. It may be extended as a means of preparing the disabled person for employment or of making him more advantageously employable through achieving a greater variety of remunerative skills and capacities.

The Federal-State rehabilitation programme has found it advisable to purchase or secure appropriate training facilities from established agencies, public and private, rather than establish special training facilities for the disabled. Use has therefore been made of colleges and universities, public and private vocational and trade schools, correspondence courses, extension courses and tutorial services. Some States have increasingly tended to set up their own facilities to meet the needs of their own disabled persons, especially vocational adjustment centres for the blind. In the absence of appropriate facilities for training, special provisions have also been established for training disabled persons within industry. Such training provides for working at a job under conditions comparable to apprenticeship or somewhat similar conditions.

The policy of the Veterans Administration is also to use "recognised" and accredited colleges, universities, vocational schools and other educational institutions to provide institutional training and well-established business enterprises to afford training on the job for disabled war veterans.

Under Public Law No. 16, any disabled veteran of the second World War is entitled to vocational training if he—

(a) had active service between 16 September 1940 and 25 July 1947 ;

(*b*) was discharged under other than dishonourable conditions;

(*c*) has a service-connected or service-aggravated disability entitling him to compensation; and

(*d*) is determined by the Veterans Administration to be in need of vocational training.[1]

Such veterans are entitled to receive training for up to four years (or longer, if approved by the Administrator of the Veterans Administration) under the vocational rehabilitation programme for disabled veterans, where the retraining is needed to restore employability.

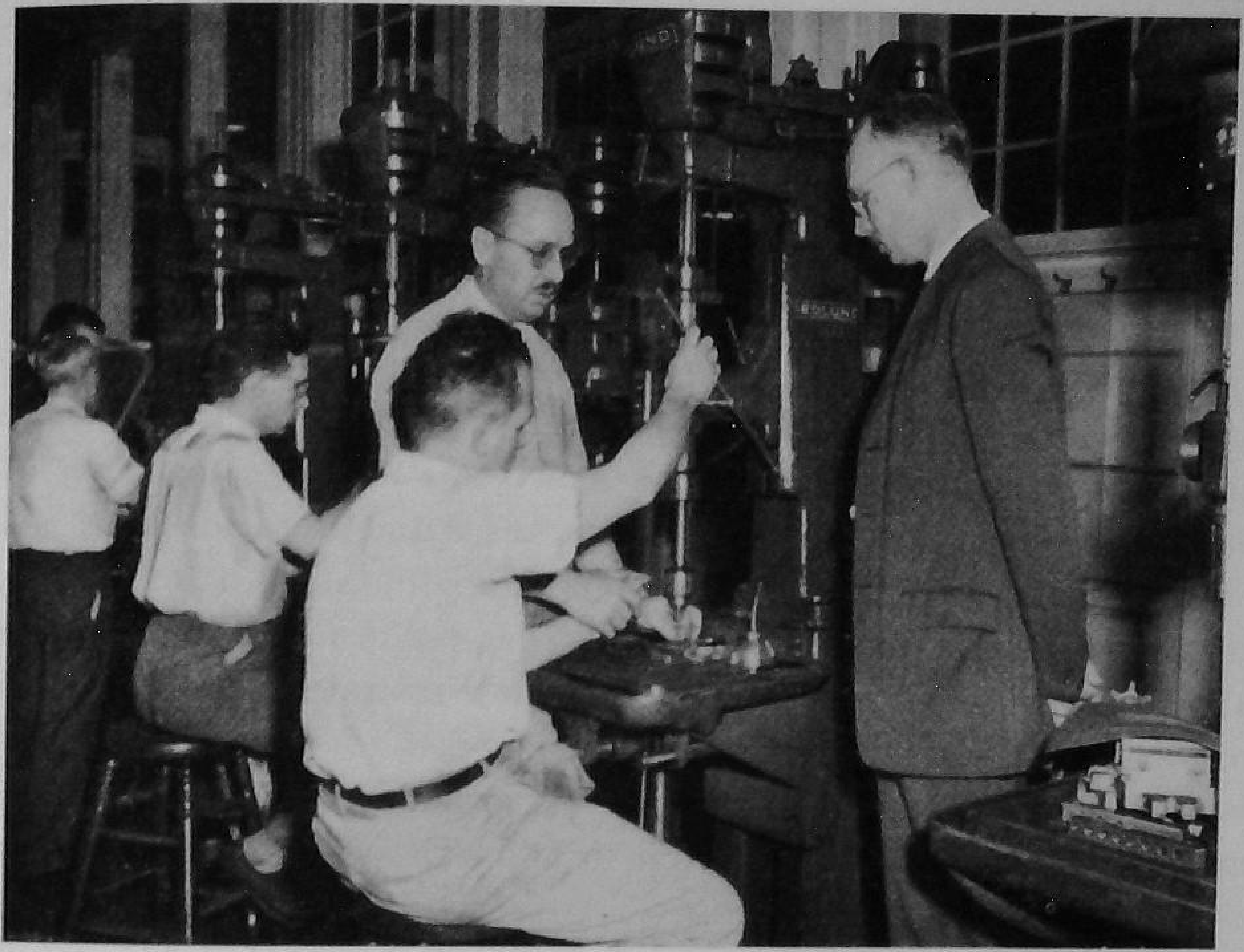
No special preference is granted by law or regulations to war veterans as far as admission to training is concerned. In practice, many vocational schools and many private undertakings grant such preference to disabled veterans.

Apprenticeship programmes have been modified in some respects in favour of veterans, including disabled veterans. These modifications, noted in Chapter III above, relate, for example, to raising the maximum age limit for admission to apprenticeship training by allowing otherwise qualified veterans to enter such training if they were of apprenticeable age when they joined the Army or Navy, and to evaluate service experience with a view to allowing appropriate credit on the required term of apprenticeship for any applicable trade experience. Many employers are co-operating in efforts to open apprenticeship for handicapped workers generally, and many trade unions are trying to stimulate apprentice recruiting among disabled veterans.

No special projects for the retraining of handicapped women have been undertaken or are considered necessary. Disabled women, including housewives, are trained in principle according to their abilities and needs, without regard to their sex.

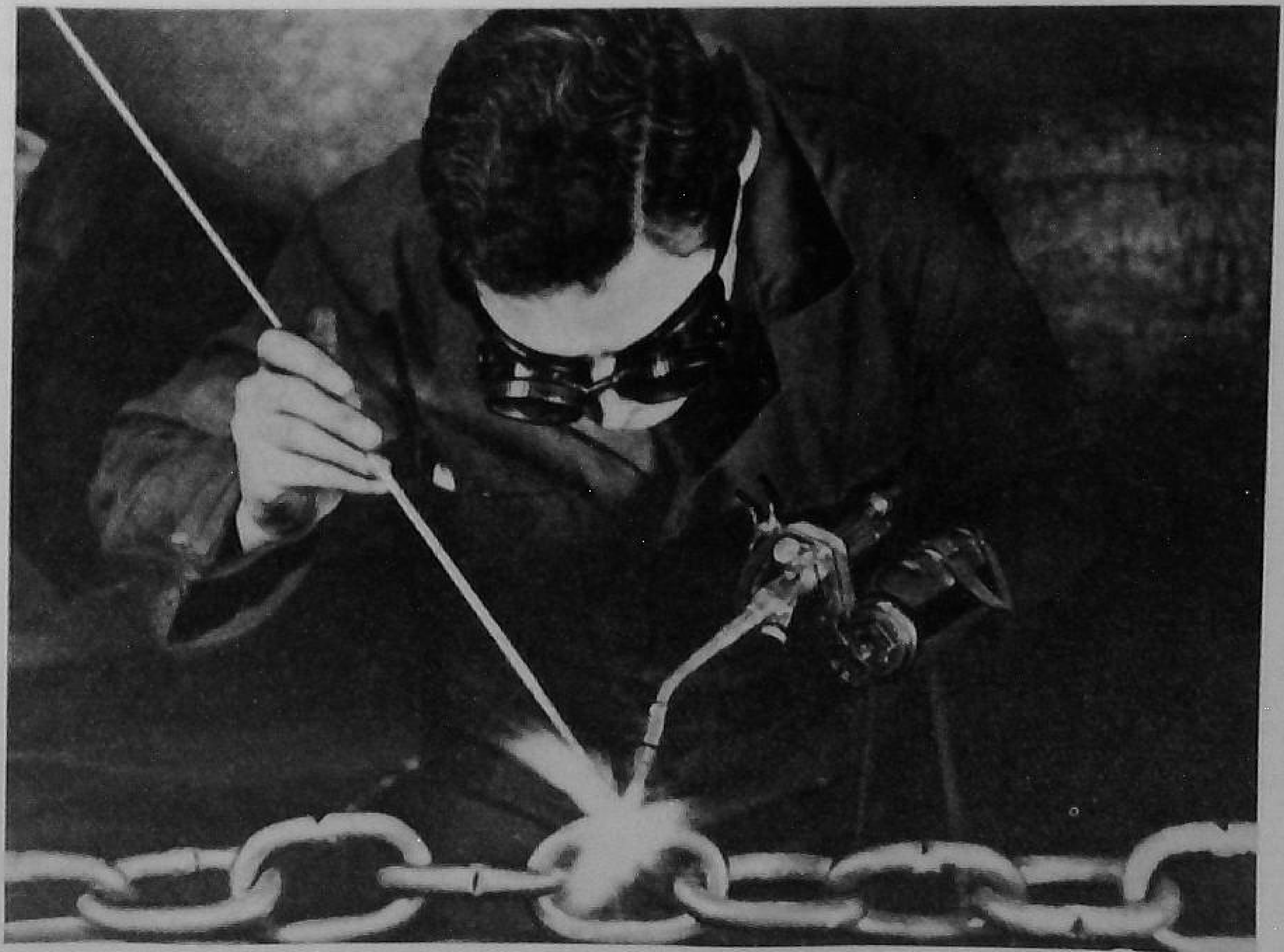
Disabled persons, whether civilians or war veterans, are thus being trained in most of the wide varieties of trades, occupations or jobs being taught in all the various training schools and institutions throughout the country. The guiding principle is that the handicapped shall not be regarded as constituting a special training problem. After a suitable occupation has been determined for a disabled person with the help of the rehabilitation agency (or the Veterans Administration, as the case may be) and the Employment Service, the same training facilities, methods and techniques are used as are employed for any other trainee.

[1] All veterans rated as 30 per cent. disabled are considered entitled to training.



By courtesy of the Office of Vocational Rehabilitation.

Blind industrial specialist (left) from the Federal Security Agency Office of Vocational Rehabilitation shows a blind worker how to operate a drill press; employer (right) looks on.



By courtesy of the Office of Vocational Rehabilitation.

One-armed welder.

The Government agencies concerned are trying to ensure that the training of the disabled is not only practical in terms of their employment prospects but as broad as possible. For example, in the case of young and inexperienced handicapped veterans, efforts are made to provide training of such nature and scope as may be indicated by the capacity of the worker, the conditions in which training can be made available and the employment conditions and requirements which must be met. The aim of vocational rehabilitation training under the Veterans Administration, and also of that under the Office of Vocational Rehabilitation, is to provide the person concerned with a well-rounded knowledge and the ability to perform all the skills and job operations which make up the occupation. In this way it is hoped to give the disabled worker as much adaptability and versatility as possible, thereby making it easier for him to find, retain and, where necessary, refind a job.

Employers are not required to conform to any quota system in admitting disabled persons into training. Training and employment arrangements are purely voluntary. It is considered that the introduction of any element of compulsion would tend to defeat the purpose of the programme. Moreover, no special arrangements are made to induce employers to undertake the training or retraining of disabled workers, though in many States and communities the Employment Service, veterans' representatives and rehabilitation agents work together or separately to broaden in-plant training opportunities for disabled persons. Moves to modify apprenticeship programmes and to supplement training pay for disabled veterans in in-plant training have constituted steps in this direction ; other steps have included educational campaigns and employer-training institutes, aimed at showing employers that disabled persons can be capable and fully efficient trainees and at helping employers to organise suitable in-plant training arrangements for the handicapped.

There has been a tendency in recent years for a larger number of disabled persons to receive training both in schools and on the job. Moreover, during and since the last war, the number and proportion of disabled persons trained on the job have increased considerably.

Of the 229,646 disabled veterans still in training under Public Law No. 16 at the end of April 1947, 128,877 were enrolled in educational institutions (nearly 83,000 in colleges or universities) and 100,769 in on-the-job training, including apprenticeship. During

the fiscal year ended June 1947, 5,441 civilian disabled persons received employment training and 26,816 received training in educational institutions.

In general, disabled persons are able, in principle, to enter all forms of training on the basis of their merits. Some discrimination is still found in practice, however, wherever disability is involved. There is discrimination against disabled workers in training programmes — less than before the war, but enough to constitute a problem. In determining suitable training, the rehabilitation agency, for example, has to take into account the possibility of the person's subsequent employment on a full-time basis. Where employers' hiring standards tend either to exclude disabled workers or to restrict their opportunities, their training opportunities become more limited, in out-of-plant as well as in-plant training programmes.

Another problem has been that of equal dispersion of available training facilities. In thickly populated States there is a wide variety of training possibilities, but in less densely populated States the possibilities are very limited. As the result of amending legislation passed in 1943, provision was made for transportation costs, and disabled persons may now be sent to other communities or States to secure the specific type of training best suited to their individual needs.

Selection of Trainees

Under the Federal-State rehabilitation programme, training or retraining courses and other services which may be necessary to render a disabled person fit for employment, are determined as a part of the individual rehabilitation plan as a whole. Before any course or programme of services is approved, therefore, the rehabilitation officer investigates the suitability of the proposed training or services in relation to the abilities of the disabled person and his employment objectives, and then their feasibility in relation to available facilities. In determining feasibility, consideration is given to such questions as age, language difficulty, if any, and the applicant's capacity to profit from the training or other services.

Veterans seeking training assistance under Public Law No. 16 must select their course with the advice of a Veterans Administration vocational counsellor. If necessary, tests are used to disclose the veteran's aptitudes and interests. The selection of the occupation in which training will be given is contingent on his education,

occupational experience, personal desires and present disability. The course selected must be approved by the vocational training section of the Veterans Administration.

The Federal-State Employment Service, on the basis of counselling and interviews, also refers handicapped workers to training where this is appropriate.

Finally, the selection of disabled workers for in-plant training is the responsibility, as a rule, of the individual employer. For apprentice training, however, and in some other forms of on-the-job training, joint employer-worker committees interview persons applying for admission to apprenticeship.

In addition to these arrangements, considerable discretion in the selection of disabled workers for training courses is left to the schools and other institutions actually providing the training. This would be the case where disabled workers are not referred for training by any Government agency, for example. In such cases, the selection is based largely on tryout periods, sometimes supplemented with special tests.

Conditions of Training

If medical supervision during training is necessary, it may be arranged by the rehabilitation agency or provided under the rehabilitation programme. As a rule, a person does not enter training or retraining until he has been medically approved. Arrangements for medical supervision of disabled civilians undergoing retraining are not always systematic and continuous. Where such persons are placed in in-plant training, especially in larger plants, they are more likely to get competent medical supervision to ensure that the training is suitable from a physical point of view. There is also a certain amount of medical supervision in the public vocational schools, particularly in special schools for tuberculous persons. Rest periods are outlined before the worker starts his training, but, as a rule, no special arrangements are made for disabled workers. In some schools and in some plants training disabled workers, special mechanical devices and aids are sometimes used to help workers with particular disabilities.

During training, war veterans in receipt of disability compensation are entitled to all forms of medical care necessary to prevent interruption of their course. This ensures for them competent medical care, but not necessarily continuous medical supervision during training.

The training of disabled persons in industry is carried out in

accordance with organised labour standards, State labour legislation and standards, and the rules and regulations of the Wage-Hour Division of the Federal Department of Labor. It has been found essential to enlist the full co-operation of the trade union movement in efforts to retrain disabled persons. Where labour has taken part in the organisation of the training scheme and in its operation, this co-operation is readily forthcoming.

Arrangements are made to pay allowances to disabled persons undergoing retraining; in the case of civilians, however, these allowances are conditional upon need.

Veterans with a compensable service-connected disability causing a vocational handicap who require training receive disability compensation and also a subsistence allowance during training and for two months thereafter. If the training is in a school or other educational institution, the subsistence allowance is fixed at $65 per month for a single person, $90 for a person with one dependant, etc., with a fixed minimum below which compensation plus subsistence may not fall. If a veteran is receiving training on the job and, as is common practice, his employer pays him for part of his service, the subsistence allowance may be reduced so that the total of pay and allowance does not exceed the beginning wage of a trained journeyman.

For veterans with service-connected disabilities, tuition, books, supplies and other incidentals (laboratory, health, library, etc.), or the necessary tools and equipment are furnished free of charge in all institutional training, and all necessary equipment and supplies are provided in on-the-job training, provided they are required of all other trainees taking the same course. Loans not exceeding $100 may be made to ex-service trainees undergoing rehabilitation training.

Under the Federal-State programme for disabled civilians, as amended in 1943, disabled persons who need financial help and will be employable after training may receive a maintenance allowance to cover essential living expenses, transportation and training materials and supplies. Authorisation to grant such an allowance is given by the State rehabilitation agency, and the amount is fixed according to the need of each individual case. Occupational tools, licences and equipment may be supplied when necessary. The funds provided as a maintenance allowance are restricted to the man being rehabilitated and are not extended to his family. It is sometimes necessary, therefore, to arrange maintenance for the family through public or private assistance agencies.

The chief differences in the payments made during training to disabled ex-service men and to civilians are that: *(a)* veterans with compensable service-connected disabilities who are eligible for training receive the pay and allowances regardless of need, while the payment of any maintenance allowance to civilian disabled workers is dependent on need; and *(b)* the amount granted to veterans includes dependants' allowances, while the maintenance allowance for a civilian worker is for his own essential living expenses alone, not his family's.

Under Public Law No. 16, a disabled veteran may continue vocational training and draw subsistence allowance as well as disability allowance for up to four years or a longer period if so determined by the Veterans Administrator. For those training on the job at the end of April 1947, the authorised courses averaged about 29 months.

Home Training for the Seriously Disabled

The Office of Vocational Rehabilitation is studying the problems involved in organising home training for seriously disabled persons, but no definite policy has yet been fixed. It is recognised that many persons could benefit from such training. Consequently, the Office of Vocational Rehabilitation operates on the principle that seriously disabled persons who must stay at home shall not be excluded and that services must be provided to them as to others. Already arrangements have been made in some cases for correspondence courses and tutorial supervision for such persons in their homes. Home training is also organised in some cases by private agencies (social welfare agencies or, more often, agencies interested in particular groups of the disabled, such as cripples).

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No. 3. *Executive Decisions*. By W. DIETZ and M. J. KANE.
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VI. Trade Union Training Activities [1]

General

AMERICAN FEDERATION OF LABOR, Washington.

CONGRESS OF INDUSTRIAL ORGANIZATIONS, Washington.

Examples of Particular Industries or Occupations

Clothing.

AMALGAMATED CLOTHING WORKERS OF AMERICA, New York.

INTERNATIONAL LADIES' GARMENT WORKERS' UNION, New York.

Iron and Steel.

UNITED STEELWORKERS OF AMERICA, Pittsburgh, Pa.

Mining.

UNITED MINE WORKERS OF AMERICA, Washington.

[1] The organisations listed below may be consulted, among others.

Printing.

International Printing Pressmen and Assistants' Union of North America, Rogersville, Tenn.

International Typographical Union, Indianapolis, Ind.

VII. Special Training Needs

Ex-Service Personnel

U.S. Laws, Statutes, etc. *Laws Relating to Veterans.* Washington, 1947. (In particular : *Servicemen's Readjustment Act of 1944*, Public No. 346, 78th Congress, 22 June 1944, as amended.)

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KESSLER, H. M. *Rehabilitation of the Physically Handicapped.* New York, Columbia University Press, 1947.

METROPOLITAN LIFE INSURANCE COMPANY. *The Employment of the Handicapped Veteran.* New York, 1944.

NATIONAL ADVISORY COMMITTEE ON SHELTERED WORKSHOPS. *A Statement of Elementary Standards respecting the Policies, Organisation, Operation and Service Activities of Sheltered Workshops.* New York, 1944.

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U.S. INTERAGENCY COMMITTEE ON REHABILITATION SERVICES FOR SEVERELY HANDICAPPED PERSONS. *A Community Program for the Rehabilitation of the Severely Disabled.* Washington, 1947.

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VIII. International Labour Office Publications

Conference Documents

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Studies and Reports

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Periodicals

International Labour Review. Published monthly.

Industry and Labour. Published twice monthly. (From August 1940 to December 1948, incorporated with the monthly *International Labour Review*, under the title "Industrial and Labour Information". Includes information on vocational training developments in all countries.)

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United Kingdom : Mr. Clifton ROBBINS, 38 Parliament Street, London, S.W.1. ("Interlab London"; *Tel.* Whitehall 1437.)

United States : Mrs. Elizabeth ROWE, 1825 Jefferson Place, Washington, 6, D.C. ("Interlab Washington"; *Tel.* District 8736.)

Correspondents :

Brazil : Mr. A. BANDEIRA DE MELLO, Ministerio do Trabalho, 2º andar, Rio de Janeiro. ("Interlab Rio"; *Tel.* 42-0455.)

Bulgaria : Mr. Dimitri NIKOLOV, 1 Patéritza Street, Sofia-Kniajevo.

Czechoslovakia : Dr. Jiri FISCHER, c/o Ministry of Labour, Prague.

Egypt : Mr. Ragheb BOUTROS, P.O. Box No. 3, Heliopolis, Cairo.

Greece : Mr. E. D. MAZARACHI, 51 Patriarche Joachim Street, Athens.

Ireland : Miss Brighid STAFFORD, 1 Upper Pembroke Street, Dublin. (*Tel.* Dublin 6 21 29.)

Poland : Mr. Jan ROSNER, Miedzynarodowe Biuro Pracy, Czerniakowska 231, Warsaw, Z.U.S.

Sweden : Mr. Sture THORSSON, Socialdepartementet, Stockholm.

Syria : Mr. Ihsan JOUKHADAR, Ministry of Labour, Damascus.

Agents for the sale of publications :

Australia : Messrs. H. A. Goddard Pty., Ltd., 255a George Street, Sydney.

Palestine : Mr. Leo Blumstein, 35 Allenby Street, Tel-Aviv.

United Kingdom : Geo. Allen and Unwin Ltd., Ruskin House, 40 Museum Street, London, W.C.1 *(International Labour Review)* ; Staples Press Limited, 14 Great Smith Street, Westminster, London, S.W.1 *(Studies and Reports* and *Year Book of Labour Statistics)*.

Also from Correspondents in **Argentina, Belgium, Bolivia, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Mexico, Peru, Uruguay** and **Venezuela.**

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Apart from subscriptions and orders, all correspondence concerning the publications (requests for information, suggestions, etc.) should be addressed to the International Labour Office in Geneva (Editorial Section).

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